THE LYING GAME: HOW OFTEN AND TO WHOM DO INDIVIDUALS WITH PSYCHOPATHIC TENDENCIES LIE?

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ABSTRACT

Psychopathic individuals have widely and persistently been depicted as prolific and masterful liars within the clinical lore and the popular media. However, the paucity of research in this area has generally contradicted the claim that such individuals possess a superior ability, compared to nonpsychopathic individuals, in deceiving others. The present research examined the sound but largely untested hypothesis that psychopathic individuals' apparent success at lying may simply be a function of their prolific pursuance of such behaviour. That is, the mere possibility that psychopathic individuals may pursue lying behaviour more frequently than nonpsychopathic individuals could explain why they appear to be more successful at lying over time, even if their rate of successful lying is unremarkable (Billings, 2004). Lying frequency was measured using a non-zero-sum game originally developed by Berg, Dickhaut, and McCabe (1995), which was modified in the present research to allow participants a number of opportunities to lie or to tell the truth, prospectively with their decisions affecting their chances of winning a prize. In addition to lying frequency, lying severity was also examined. Further, both of these variables were examined across males and females and across different types of social interactions (i.e., playing the game after having met/seen [Exposure Condition] compared to not having met/seen [Non-Exposure Condition] the other person). Psychopathy was measured using the Psychopathic Personality Inventory – Revised (PPI-R; Lilienfeld & Widows, 2005) and the Levenson Self-Report Psychopathy scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995). Machiavellianism, a construct that is similar, or overlapping with Psychopathy, as some have argued (McHoskey, Worzel, & Szyarto, 1998), was measured using the Mach-IV scale (Christie & Geis, 1970; McHoskey et al., 1998). Overall, the results suggested that lying frequency and lying severity were related to psychopathy when participants were able to see and interact with their opponents prior to playing the game but not when they were not provided with the opportunity to do so. No significant differences in lying frequency and lying severity were found between males and females across the two types of social interactions. The results on a post-experiment self-report measure also suggested that psychopathy was related to certain characteristics of self-perceived lying behaviour, though the latter was not related to lying behaviour in the modified non-zero-sum game. These findings have important implications for professionals within clinical and forensic settings, as they suggest that psychopathic individuals may not lie as indiscriminately as generally perceived.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Lying, the intentional provision of misinformation to an unforwarned other (Ekman, 2009) is a relatively common phenomenon (DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996) that is generally considered to be morally objectionable. When one engages in a lie, or some other form of deceptive behaviour, with the intent of influencing another to behave in a way that he or she otherwise would not, without his or her knowledge and usually to one's own advantage, this is referred to as manipulation (Buss, Gomes, Higgins, & Lauterbach, 1987; Seabright & Moberg, 1998). Although research has found lying and manipulation to be ubiquitous (Buss et al., 1987; DePaulo et al., 1996), it has also found that our ability to detect lies or deceit[1] in everyday interactions is only slightly better than chance (Billings, 2004; Bond & DePaulo, 2006; Kraut, 1980), suggesting that our ability to get away with lying is superior to our ability to detect lies. However, there exists a distinct subpopulation of individuals who are not only considered to be especially good at lying but also particularly willing to do so, a group known clinically as psychopaths.

Definition of Psychopathy

Hare (1996) has described psychopathy as a "socially devastating disorder" (p. 25) that affects more than just the 1% of individuals within the general population who may be classified as psychopathic. Collectively, psychopaths commit an inordinate share of the more serious offences in every society surveyed (Hare, 1996). Consequently, they also comprise 15% to 25% of the prison population (Hare, 1996). Although the terms psychopathy and antisocial personality disorder (APD) are often used interchangeably, the two syndromes are not equivalent (Hare, 1983; 1996). The DSM-IV criteria for APD focus almost exclusively on a set of observable behaviours, such as "destroying property, harassing others, stealing, or pursuing illegal occupations" (American Psychiatric Association [APA], 2000, p. 702). On the other hand, psychopathy is a clinical disorder brought to the public's awareness in 1941 by Hervey Cleckley in his book *The Mask of Sanity*, which was based on his clinical experiences as a psychiatrist

[1] Some authors distinguish lying from deceit, as lying is a form of deceit (e.g., Jackson, 1991), while others use the terms interchangeably (DePaulo et al., 1996, Ekman, 2009, Lewis, 1993). I will hereafter adopt the latter approach in this document.

(Cleckley, 1976). As described by Cleckley and more recently adapted and modified by Hare (1970), the criteria for psychopathy focus primarily on a cluster of pejorative personality characteristics, including "irresponsibility," "conning/manipulative," "pathological lying" (Hare, 1996), and "callous/lack of empathy," the last of which is considered the essential feature of the disorder (Cleckley, 1976).

The experience of empathy and other emotions, both moral (e.g., guilt and shame) and basic (e.g., fear), is considered critical for proper moral development (Blair, Mitchell, & Blair, 2005; Gibbs, 2010; Lykken, 1957). Many have observed that psychopathic individuals are unable to experience the full spectrum or intensity of human emotion (Cleckley, 1976; Hare, 2003). Indeed, psychopaths have famously been described as "know(ing) the words but not the music" (Johns & Quay, 1962, p. 217). Blair (1995) argued that psychopathic individuals fail to become morally socialized due to a defective violence inhibition mechanism (VIM). He described the VIM as a cognitive mechanism, which in normal development, is activated in an observer (e.g., a bystander or an aggressor) by the presence of distress cues in others, such as sad or fearful facial expressions and screaming or crying. These cues may all function as submission responses in aggressive or threatening situations. The activation of the VIM prompts a withdrawal response from the observer (e.g., a bystander or the aggressor in the situation), as the submission responses are experienced as aversive, and over time individuals become socialized to dislike the pain of others. However, due to an impaired VIM, psychopathic individuals do not experience distress cues as emotionally aversive, and thus may continue to attack rather than withdraw from an aggressive situation. Lykken (1957), on the other hand, proposed that psychopathic individuals fail to become morally socialized due to a deficiency in experiencing fear in response to punishment. More recently, Blair et al. (2005) have integrated the VIM and the fear dysfunction theories to produce the integrated emotions systems (IES) model to explain the emotional impairments associated with psychopathy. The authors suggested that the amygdala, which is involved in the processing of emotionally laden information and thus is essential to moral socialization, is dysfunctional in psychopathic individuals.

Despite the existence of several theories regarding the etiology of the emotional impairment observed in psychopathic individuals, the central idea behind these theories appears to be that psychopathic individuals' deficiency in experiencing emotions, particularly moral emotions, prevents them from undergoing proper or normal moral development. Consequently,

they are at higher risk for engaging in morally objectionable behaviours such as, manipulating, defrauding, or lying to others. Nevertheless, it is clear that laypersons and experts alike presume that psychopathic individuals possess a proclivity toward using their superior ability to deceive and manipulate, causing harm to others (Cleckley, 1976; Hare, 1991a, 1993, 2003; Hare, Forth, & Hart, 1989).

The Lying Behaviour of Psychopaths as Depicted in the Clinical Literature and Media

Within the popular media, examples are rife with how real-life criminals deemed to be psychopaths cunningly and callously lied to and manipulated their victims. For example, Ted Bundy, the notorious American serial killer, was noted to have duped unsuspecting female strangers into helping him transport heavy items into his car by wearing his arm in a phony cast and sling in order to appear injured and vulnerable (Michaud & Aynesworth, 1999). Christopher Rocancourt, another alleged psychopath, defrauded numerous members of the Hollywood elite out of millions of dollars by assuming various false identities (e.g., the nephew of Sophia Loren, etc.) and promising them significant returns on loans, which he never intended to repay (Leung, 2003). In interviews, Rocancourt has consistently appeared to show little remorse for his actions. Rather, he has rationalized them by projecting blame onto his victims, believing that he did not in fact steal from any of these individuals, whom he has described as being "not that bright," but merely borrowed from them (Leung, 2003; Taibbi, 2008).

Similarly, in the clinical realm, psychopaths are described as particularly devious. For example, according to the Psychopathy Checklist-Revised (PCL-R; Hare, 2003) - a measure that is considered to be the current gold standard in the assessment of psychopathy in adult forensic populations – arguably, the two items most relevant to psychopathic individuals' purported proficiency in deception are: Pathological Lying and Conning/Manipulative. In terms of the former, the PCL-R description for the item is as follows:

> … an individual for whom lying and deceit are a characteristic part of his interactions with others. He is capable of fabricating elaborate accounts of his past even though he knows that his story can easily be checked. His readiness to lie, and the apparent ease with which he carries it off (even with people who know him well), can be quite remarkable… Moreover, even after repeatedly breaking his promises and commitments to someone he still finds it easy to make new ones on "his word of honor." He often lies for obvious reasons, but

> deceiving others also appears to have some intrinsic value for him. He may freely discuss and take pride and pleasure in his ability to lie (p. 37).

In terms of the latter (i.e., Conning/Manipulative), the description for the item is as follows:

> … the use of deceit and deception to cheat, bilk, defraud, or manipulate others. The use of schemes and scams, motivated by a desire for personal gain (money, sex, status, power, etc.) and carried out with no concern for their effects on victims… Some of these operations are elaborate and well thought out, whereas others are quite simple; in each case they are carried off in a cool, self-assured, or brazen manner (p. 37).

Thus, both of these items describe psychopaths as individuals who choose to and derive enjoyment in using their alleged exceptional skills in lying and manipulation to benefit themselves at the expense of others, even with those to whom they are close.

The Lying Behaviour of Psychopaths as Depicted in the Research Literature

The above descriptions represent the prototypical notions of both clinicians and laypersons alike with respect to the abilities of psychopaths to deceive. However, despite the abundant media portrayals and rich clinical accounts (e.g., Cleckley, 1976; Hare, 1993) that depict psychopaths as especially prolific and skilled liars and manipulators, there exists a dearth of empirical studies that have systematically examined this claim. Indeed, fundamental questions about the nature of lying and manipulative behaviours in this population have yet to be answered within controlled experimental settings. Rather, given the aforementioned destructiveness that results from the dishonesty of psychopaths, it is perhaps not surprising that the few extant empirical investigations in this area have focused primarily on deception detection, specifically on identifying nonverbal indicators of deception. The rest have examined the ability of psychopaths to tell successful lies under prescribed circumstances.

Non-Verbal Indicators of Deception in Psychopathic Individuals

The first group of studies can be further divided into those that have examined the physiological responses of psychopaths and those that have examined the behavioural presentation (viz., body language) of psychopathic individuals while engaged in deception.

Physiological indicators. In terms of the former, a few studies have employed the polygraph to compare the autonomic responses of psychopathic and nonpsychopathic individuals while lying. Although some of these studies have found that psychopathic individuals evidence

reduced autonomic reactivity compared to nonpsychopathic individuals on measures of heart-rate (Raskin & Hare, 1978) and skin conductance (Verschuere, Crombez, De Clercq, & Koster, 2005), these differences did not diminish the detection accuracy of polygraph examinations (Raskin & Hare, 1978; Patrick & Iacono, 1989; Verschuere, Crombez, Koster, & De Clercq, 2007). That is, these studies found that lying psychopaths were no more likely to escape detection on the polygraph than lying nonpsychopaths.

Body language. In terms of the latter, the writer could find only two studies that have examined the behavioural presentation of psychopathic individuals while lying. One of these studies examined the relationship using a sample of 45 male offenders (Klaver, Lee, & Hart, 2007). In the study, participants were asked to produce a true statement about their current offense and a fictional elaboration of a crime they had viewed on video. Each of these conditions was taped and each allowed participants to discuss the aforementioned topics for a maximum of five minutes. Participants' level of psychopathy was assessed using the PCL-R. Participants' taped statements were later examined and coded by research assistants for nonverbal behaviours. Overall, with the exception of increased head movements in psychopathic offenders while lying, results did not indicate significant differences in nonverbal presentation between psychopathic and nonpsychopathic offender groups while engaged in deception. The researchers noted that the limited differences observed between groups may have been a result of the small sample size used.

The other study that has examined the relationship between behavioural indicators of deception and psychopathy was conducted by Billings (2004). This study, similarly, did not find many significant differences between individuals who scored high compared to those who scored low on psychopathic tendencies. In the study, participants were 60 undergraduates, who were rated on three separate psychopathy measures (i.e., Psychopathy Checklist: Screening Version (PCL: SV); Psychopathic Personality Inventory-Short Form (PPI: SF); and the Collateral Rating of Psychopathy (CRP). In the first experimental session, participants were asked to complete a questionnaire regarding their views on 12 current controversial topics. After this, the researcher selected participants' four strongest opinions and instructed them to present these views in succession while being videotaped during a second experimental session. Participants were instructed to provide their true opinion on two of the four topics and to present the opposing view as their own on the other two topics. Their taped presentations were later coded for

nonverbal behaviour by trained raters. Results did not indicate any significant differences in nonverbal behaviour between individuals who evidenced higher, compared to those who evidenced lower, levels of psychopathic tendencies. The researcher hypothesized that the non-significant results may have been a result of the sample used (i.e., university students, who may evidence lower levels of psychopathy compared to an offender sample) and the conditions imposed by the experiment (e.g., the pressure of being videotaped).

Studies Investigating the Alleged Superior Lying Ability of Psychopathic Individuals

The second grouping of studies within the psychopathy and deception literature pertains to those that have examined the alleged lying proficiency of psychopathic individuals either by observing whether such individuals are able to tell convincing lies to others or malinger successfully on psychometric tests.

Lying about personal experiences and views. Cogburn (1993) studied the ability of psychopaths to tell convincing lies in a sample of 29 male offenders. Participants took part in a mock job interview that was videotaped. Prior to the interview, participants completed a card-sorting task indicating misdeeds and prosocial acts in which they had previously engaged. After this, the researcher selected four of these choices, half pertaining to past misdeeds and half pertaining to previous prosocial acts, to be used in the interview. Participants were instructed to tell two types of lies during the interview (Lie Condition): one where they stated that they had committed a prosocial act that they had not in fact done and one where they stated that they had not committed a misdeed that they had in fact committed. Participants were also instructed to tell two kinds of truths during the interview (Truthful Condition): one where they stated that they had committed a prosocial act that they had in fact done and one where they had committed a misdeed that they had in fact committed. Psychopathy was assessed using the PCL (Hare, 1980). Later, undergraduate students were asked to view the interviews and rate, on seven-point scales, the degree to which they believed the participant in the interview was speaking candidly. Results did not support the common notion that psychopaths are masterful liars. Overall, Cogburn found that higher scores on the PCL were in fact associated with lower ratings of truthfulness. As well, she found that individuals who scored higher on Factor 2 (i.e., antisocial/deviant behaviours) but not Factor 1 (i.e., psychopathic personality characteristics such as, lack of empathy, conning/manipulative, etc.) were more likely to be perceived as dishonest in both the Lie and Truthful Conditions. More recently, Klaver, Lee, Spidel, and Hart (2009) employed a nearly

identical experimental design to investigate this issue and found results that mirrored those of Cogburn (1993; i.e., that psychopathic male offenders were rated by student judges as less plausible than nonpsychopathic offenders when recounting fabricated versions of crimes).

In addition to examining the nonverbal behaviours of students who rated high and low on psychopathic tendencies while lying, Billings (2004), described above, also examined the ability of the students to tell convincing lies. As aforementioned, 60 participants were asked to make presentations on four contentious issues. On two of these issues, they were instructed to truthfully report their views (Truthful Condition) and on the other two issues they were instructed to lie about their views (Pretend Condition). All four presentations were videotaped and later reviewed by 150 undergraduate student raters. In contrast to Cogburn (1993), prior to providing their ranking of the perceived truthfulness of each presentation, on a four-point scale (i.e., 1 = Most Truthful; 4 = Least Truthful), student raters in Billings' study were informed that the presenters had offered their actual views in two of the presentations (Truthful Condition) and their opposing views in the other two presentations (Pretend Condition). Results indicated that higher scores on measures of psychopathy, whether measured using the PCL-SV (r = .32), PPI (r = .28), or CRP (r = .32), were significantly correlated with being successful at deception.

Malingering. Other studies that have investigated the claim that individuals with psychopathic tendencies are unusually adept at deception have focused specifically on their ability to malinger, that is, their ability to feign mental illness. When explicitly instructed to malinger in laboratory experiments, individuals scoring high on psychopathic tendencies as measured by the PPI both in offender and nonoffender samples have not been found to possess a greater capacity for malingering than those scoring low on psychopathic tendencies on a variety of psychometric measures (Edens, Buffington, & Tomicic, 2000; MacNeil & Holden, 2006; Poythress, Edens, & Watkins, 2001), although they may report an increased willingness to engage in such behaviour (Edens et al., 2000).

Overall, with the sole exception of the study by Billings (2004), research generally contradicts the widely accepted notion that individuals who are high on psychopathic tendencies possess a greater capacity to deceive and manipulate others than those who are low. Interestingly, a separate subpopulation of individuals known to researchers as Machiavellians (Machs) has garnered somewhat more empirical support than psychopaths as a group with a superior ability and propensity to lie.

Machiavellianism versus Psychopathy

Machiavellians are a group of individuals who, similar to psychopaths, are considered to possess a manipulative style and to lack regard for and emotional involvement with others in their interpersonal interactions (Christie & Geis, 1970). Indeed, Machiavellianism and psychopathy have been considered by some researchers to be identical concepts. For example, McHoskey, Worzel, and Szyarto (1998) examined the relationship between psychopathy and Machiavellianism in a sample of undergraduates. Machiavellianism was assessed using the Mach-IV (Christie & Geis, 1970), the most widely used measure of Machiavellianism. The measure consists of 20 statements to which participants respond on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). Psychopathy was assessed using the Primary and Secondary Psychopathy subscales of the Levenson Self-Report Psychopathy Scale (LSRP; Levenson, Kiehl, & Fitzpatrick, 1995), a 26-item scale designed to measure psychopathy in non-institutionalized populations. Results across three separate studies indicated significant correlations between Machiavellianism and psychopathy ranging from $r = .46$ to $r = .65$ (ps < .001), leading McHoskey et al. (1998) to conclude that the two are overlapping constructs and that the MACH-IV is a global measure of psychopathy in nonforensic populations.

A more recent study by Paulhus and Williams (2002) examined the association amongst the constructs of Machiavellianism, narcissism, and psychopathy, or "the Dark Triad," in a sample of 245 university students (159 female, 106 male). Machiavellianism was measured using the Mach-IV scale; narcissism was measured using the Narcissistic Personality Inventory (NPI); and psychopathy was assessed using the Self-Report Psychopathy Scale (SRP-II). The researchers found that these measures were moderately intercorrelated, with Machiavellianism and psychopathy correlated at $r = .31$ ($p < .001$), Machiavellianism and narcissism correlated at $r = .25$ ($p < .001$) and psychopathy and narcissism correlated at $r = .50$ ($p < .001$). As a way of further examining the relationship amongst these three constructs, the researchers also correlated participants' scores on these measures with their scores on the Big Five Inventory (BFI), a paper-and-pencil personality questionnaire designed to measure the following traits: extraversion, agreeableness, conscientiousness, neuroticism, and openness. Results indicated that while individuals scoring high on psychopathy and Machiavellianism also scored low on conscientiousness, only those scoring high on psychopathy exhibited a low level of neuroticism. Narcissism and psychopathy were both significantly correlated with extraversion ($r = .43$ and

.34, respectively, *p*s < .05). As well, all three constructs were significantly negatively correlated with agreeableness (*r* = -.36 for narcissism; *r* = -.47 for Machiavellianism, and *r* = -.25 for psychopathy, *p*s < .05). Based on these results, Paulhus and Williams (2002) concluded that narcissism, Machiavellianism, and psychopathy are conceptually similar but not equivalent.

The Lying Behaviour of Machiavellians as Depicted in the Research Literature

Given the comparability between Machiavellianism and psychopathy, especially with respect to the purported lying and manipulative tendencies of individuals from each of these groups, it is perhaps not surprising that researchers in each of these areas have posed and examined similar questions. Specifically, researchers conducting studies in Machiavellianism have examined whether high Machs are in fact more manipulative and better deceivers than low Machs. While findings in this area have been mixed, it is nevertheless worthwhile to compare the methodologies employed in the studies that have found evidence to support these claims with those that have not, as this may help to elucidate our understanding of the largely null findings of similar investigations within the psychopathy literature.

One study that supports the notion that high Machs are better liars than low Machs was conducted by Geis and Moon (1981). They examined the lying ability of university students who were high and low on Machiavellianism, as measured using the Mach-IV scale, in a two-part study using the Prisoner's Dilemma Game (PDG; described in greater detail in the section "Non-Zero-Sum and Zero-Sum Games," below). In the first part, participants were introduced to the researcher and three other participants, who were in fact confederates of the researchers. To begin, participants were informed that they would be competing against one another in teams of two (i.e., the participant and one confederate against the other two confederates) in the PDG, which required each team to come to independent decisions regarding cooperation or defection with the other. Possible outcomes in this case involved different dollar amounts depending on the eventual decisions of each team. Participants were also instructed to deliberate their decisions only within their teams and never with members of the opposing team. Teams were instructed to signal with a knock on their side of an anteroom door when they had reached their decision choice. When both teams had signaled, one of the team members would notify the researcher by knocking on the door of his room. Thus, the researcher was not privy to the actions of the participants in the anteroom. Once the researcher returned to the anteroom, he noted the

decisions of the two teams and distributed the appropriate payoff in actual dollar bills to the winning team or a preprinted IOU to the losing team.

Several trials later, participants' partners would mention to the participant that cooperation was more lucrative than defection. After this, the opposing team would propose that for mutual benefit both teams should always choose cooperation in the payoff matrix for the remainder of the experiment. However, during the next trial, the opposing team would renege on the agreement causing the participant and his partner to lose money ($4). In response, participants' partners would either steal $4 from the confederate team's pile of money, place it on their own pile, and instruct the participant to keep silent or simply state angrily that the other team owed them $4 without taking any money from the other team's pile. During the next interaction in the anteroom, one member from the opposing team accused the participant's team of stealing money from their pile. The accusation was designed to put pressure on the participant to respond and deny the occurrence of a theft. All participants responded and most denied the theft during the interaction, which was videotaped.

In part two of the study, a new set of student participants were recruited to review the taped interactions and judge the credibility of the original participants' denial of theft. Judges were instructed to rate the extent to which they believed that participants in the videos were lying or telling the truth on a 6-point Likert scale (1= Definitely Lying to 6 = Definitely Telling the Truth). Results revealed that judges believed the lies of high Machs (ratings averaged 3.55 on the Likert scale) more often than those of low Machs (ratings averaged 2.94 on the Likert scale).

Exline, Thibaut, Hickey, and Gumpert (1970) found similar results in a study that examined success at lying in 24 male and 24 female university students. In the study, participants were partnered with a same-sex confederate and presented with decision-making tasks of increasing difficulty, which they were to solve cooperatively. Part way through the tasks, the researcher would exit the room to attend to an "important matter." At this point, confederates would attempt to involve participants in looking up the answers for the impending tasks. Upon return, the researcher administered the remainder of the tasks and thereafter interviewed the pair to review how they had arrived at their responses. During the course of the interview, the researcher would appear skeptical and eventually accuse the pair of cheating, sparking an interrogation period whereby the participant could confess to or deny having cheated on the tasks. The entire interaction was video-recorded behind a one-way mirror and later reviewed and

content-coded by independent judges. Results revealed that high Machs denied cheating more often than low Machs. High Machs were also rated as more plausible in their denials than low Machs.

Further evidence supporting the notion that Machiavellians possess a superior ability in lying to and manipulating others successfully has also been found in several studies using children as participants. These studies employed a simplified version of the Mach-IV scale (i.e., the Kiddie Mach scale; Nachamie, 1969 as cited in Christie and Geis, 1970) to measure degree of Machiavellianism in elementary-aged children. Results from these studies suggested that high Mach children were more successful at deceiving others at a bluffing game than low Mach children (Kraut & Price, 1976; Nachamie, 1969 as cited in Christie and Geis, 1970) and that high Mach children were also better at using deceit to convince another child to eat more quinine flavoured crackers than low Mach children (Braginsky, 1970).

Despite the positive findings of the studies described above, other studies have found evidence that contradicts the claim that high Machs are better deceivers than low Machs (Epstein, 1969; Janisse & Bradley, 1980). Some researchers have suggested that a major reason for the discrepancy in results is because the studies that have found supporting evidence provided participants with the autonomy to decide the occasion and content of the lie, as well as sufficient motivation to engage in deception (Geis & Christie, 1970; Wilson, Near, & Miller, 1996). In contrast, those studies that have found conflicting evidence explicitly stipulated these aspects to participants, thereby possibly hindering participants' capacity and motivation to lie convincingly (Geis & Christie, 1970; Wilson et al., 1996). This same reasoning can also be applied to understanding the rather consistent null findings in the psychopathy and lying research literature.

Comparing Methodologies from the Psychopathy and Machiavellian Research Literatures

Though lying ability has been examined in the Machiavellian and, to some extent, in the psychopathy literatures, a considerable proportion of the research within the latter has employed a nearly identical methodology. Similar to the participants in some of the Mach studies mentioned above, participants in psychopathy studies have not been placed in situations where they could choose to lie or tell the truth. Instead, they were told specifically when to lie and what to lie about. More specifically, researchers in this area have tended to instruct participants to invent and truthfully report on various topics (i.e., personal experiences or views) and then gauged participants' level of trustworthiness either by using human judges or some instrument,

such as a polygraph test or paper-and-pencil measure. Not only does this type of design significantly diminish external validity, it also neglects potentially sound explications for psychopathic individuals' seeming superiority at lying and manipulation, aside from the possibility that such individuals truly do possess an exceptional ability in this domain.

Specifically, one fundamental but empirically overlooked explication for psychopathic individuals' apparent success at lying and manipulating others is that it may simply be due to their perseverance in pursuing these behaviours. To clarify, perhaps the clinical observation that psychopaths are prolific liars (Cleckley, 1976) is what drives the common notion that they are masterful liars and manipulators, as "a low base-rate for 'success at deception' could result in a significant number of successes over the course of many trials" (Billings, 2004, p. 37).

However, this fundamental question of how frequently psychopaths will lie when given the opportunity to do so has apparently never been examined empirically, with the exception of Klaver et al. (2007), who measured participants' (i.e., 45 male offenders) self-reported lying frequency on a 5-point Likert scale (i.e., 0 = Never; 4 = Always) and found no association with PCL-R Total, as well as with Factor scores (i.e., PCL-R Total score, r = -.16, p = .29; Factor 1 (i.e., Arrogant and Deceitful Interpersonal Style) score, r = -.16. p = .30; Factor 2 (i.e., Deficient Affective Experience) score, r = .01. p = .96; Factor 3 (Impulsive and Irresponsible Behavioral Style) score r = -.14, p = .38). Although the use of self-report measures represents an important initial step in the context of examining this issue, the employment of behavioural measures in future studies is necessary to achieve a more comprehensive and nuanced understanding. To this end, one promising approach that has been applied to the investigation of other research questions is the non-zero-sum game. Some researchers favour the use of non-zero-sum games in experiments because they elicit interactions between participants that closely approximate situations encountered in the real world.

Non-Zero-Sum and Zero-Sum Games

The term non-zero-sum game is derived from game theory and refers to a situation where the sum of the total gains and losses (treating the losses as negative values) of all interacting players or participants does not equal to zero (Rasmusen, 1989). One example of a non-zero-sum game is the Trust Game (Berg, Dickhaut, & McCabe, 1995; Camerer, 2003). The game is usually played between two individuals, with one individual, the Investor, deciding how much of his/her initial "show-up fee" to give to the other player, the Trustee or Receiver. Prior to reaching the

Trustee, the sent amount is increased by some factor and then the Trustee decides how much of the received amount to divide with the Investor. According to economic models of behaviour, individuals are assumed to act in a self-interested manner and behaviour that digresses from self-interest is seen as irrational (Berg et al. 1995). As such, according to theory, the rational outcome in the Trust Game is for the Investor or Sender to give nothing, as he or she assumes that the Trustee will not reciprocate. Interestingly, however, research has consistently found that a significant number of Investors will offer money and a significant number of Trustees will reciprocate, although the amounts offered and reciprocated vary from study to study. Researchers have proposed several explanations for the behaviour of Trustees in such situations, namely, moral obligation or altruism (McCabe, Rassenti, & Smith, 1998)

The Prisoner's Dilemma game (PDG), mentioned earlier, is another well-known example of a two-player non-zero-sum game. The premise of the game is that police have captured two individuals, whom they suspect are responsible for committing a serious offense, but only possess sufficient evidence to convict them on lesser charges (Camerer, 2003). The two suspects are placed in separate interview rooms with no opportunity to communicate with the other. They are given the chance to confess with the payoff of being convicted of the lesser crime. The suspects (i.e., participants) are faced with the choice of cooperating with (i.e., remaining silent) or defecting against (i.e., confessing) the other player. As shown in Figure 1.1, when both players cooperate (i.e., remain silent), the outcome is CC, where each player receives 1 year in prison. CC is better than DD (e.g., 5 years in prison each), mutual defection (i.e., confessing or betraying the other player). However, when one player defects and the other cooperates, the outcome is DC or CD: the defector earns a payoff that is better than that of CC (e.g., immunity or zero years in prison), and the cooperator earns a payoff that is worse than that of DD (e.g., 10 years in prison). Thus, in a non-zero-sum game, such as the PDG, there exists several possible outcomes (i.e., multiple winners, multiple losers, or a winner and a loser).

In contrast to the above examples, a zero-sum game is a situation where the sum of the total gains and losses of all interacting players is equal to zero. In zero-sum games, such as Chess, there can only be one winner and one loser. Researchers (Camerer, 2003) argue that non-zero-sum games more accurately represent the complex dynamics of the real world than zero-sum games because they not only require us to anticipate others' actions and to reflect upon what

		Player A: **C**(ooperate)	Player A: **D**(efect)
Player B	**C**(ooperate)	1, 1	10, 0
	D(efect)	0, 10	5, 5

Figure 1.1. Payoff Matrix for a Prisoner's Dilemma Game. Adapted from Camerer (2003, p.45)

others will infer from ours but also because the final outcome of such interactions tend to be unpredictable and complex. Thus, the use of non-zero-sum games may help to increase external validity while still achieving adequate experimental control. Consequently, many researchers have used non-zero-sum games to study a variety of social dilemmas and behaviours (e.g., trust and cooperation).

Psychopathy and Non-Zero-Sum Games

Within the psychopathy literature, non-zero-sum games, specifically Prisoner's Dilemma, have been employed on a few occasions to investigate the concept of cooperation in psychopathic individuals. While conclusive results on the issue have yet to be achieved, recent investigations have tended to find significant associations between psychopathy and defection in the PDG within experimental settings. For example, Mokros et al. (2008) examined this relationship in 48 male participants. Half of the participants were psychiatric inpatients, who had been previously diagnosed with psychopathy (i.e., scores ranging from 20-36 out of a maximum total of 40) using the PCL-R. The other half of the participants consisted of "non-academic" males from the community. Level of psychopathy in this group was assessed using the Psychopathic Personality Inventory- Revised (PPI-R).

In the study, participants played a version of the Prisoner's Dilemma Game (PDG) on a computer over 40 trials, with a "computerized dummy" as the opponent. The computer opponent was programmed to use a "tit-for-two-tats" strategy, meaning that to begin the computer responds in a cooperative manner and continues to respond cooperatively until the participant

defects twice in a row (Novak, 2005). Once this occurs, the computer defects on the next round and on all subsequent trials. Cooperation by the computer opponent is restored if the participant returns to using a cooperative strategy. Results indicated that psychopathic individuals were significantly less cooperative than the nonpsychopathic individuals, with the odds of defecting in the game being 7.86 times higher in psychopaths compared to nonpsychopaths. More recently, Curry, Chesters, and Viding (2011) also found that individuals scoring high on certain subscales of the PPI-R (e.g., Machiavellian Egocentricity) were also less likely to be cooperative while playing several modified versions of the PDG than those scoring low.

While the PDG allows researchers to examine cooperation in a controlled experimental setting, the Trust Game may be more ideally suited, with slight modification, toward examination of lying behaviour. The main reason for this pertains to the design of the two games. Specifically, players' decisions in the PDG are made simultaneously while players' decisions in the Trust Game are made in succession (Gunnthorsdottir, McCabe, & Smith, 2002). The exchange of information in the latter allows for an opportunity for players to provide misinformation to the other whereas there is no such opportunity for exchange in the PDG, without significant modification to the design of the game[2]. As well, the Trust Game, as the name implies, measures "pure trust" (Camerer, 2003, p. 85). Consequently, it is arguably more relevant to the study of lying and manipulation than is cooperation, which is frequently studied using the PDG. Unfortunately, to date, no one has used the basic structure of the Trust Game to examine lying behaviour in individuals with psychopathic tendencies.

Machiavellianism and Non-Zero-Sum Games

Non-zero-sum games have also not been used extensively with Machiavellian individuals within the psychological literature. However, they have been employed with Machs somewhat more extensively within the fields of business and economics over the last decade, primarily in studies of trust and cooperation rather than lying or manipulation. For example, Gunnthorsdottir et al., (2002) employed a version of the Trust Game to examine trust and reciprocity in undergraduates who scored high and low on Machiavellianism, as measured using the Mach-IV scale (Christie & Geis, 1970). The specific Trust Game they employed is entitled the $10 Trust

[2] During the data analysis stage of the present research, the writer came upon a study by Curry et al. (2011), who developed and employed a significantly modified version of the PDG that allowed participants to make sequential decisions. A PDG modified in this way is comparable to the Trust Game (Camerer, 2003).

Game or the Investment Game and was devised by Berg et al. (1995). The game is played between two individuals, with one player designated as Player 1 (P1) and the other designated as Player 2 (P2). As is inherent in Trust Games, players are given an initial endowment or show-up fee. In this case, both players were each given a show-up fee of $10.

The $10 Trust Game is depicted in Figure 1.2, with the boxes at the end of each decision node containing the final payoffs of each player (P1's payoff is always shown above P2's payoff). To begin, P1 decides whether or not to give any of his or her initial show-up fee to P2. If P1 decides not to give any money to P2, he or she moves to the right along the decision tree, thus ending the game with both players keeping their original $10 show-up fee. However, P1 may convey trust in P2 by selecting the riskier option of giving money to P2 (e.g., $10). Any sent amount then triples before it reaches P2 (e.g., $10 becomes $30). At this point P2 may decide either to split the tripled amount evenly with P1, resulting in both players finishing the game with more than their original $10 show-up fee (e.g., $15 for P1 and $25 for P2) or he or she may

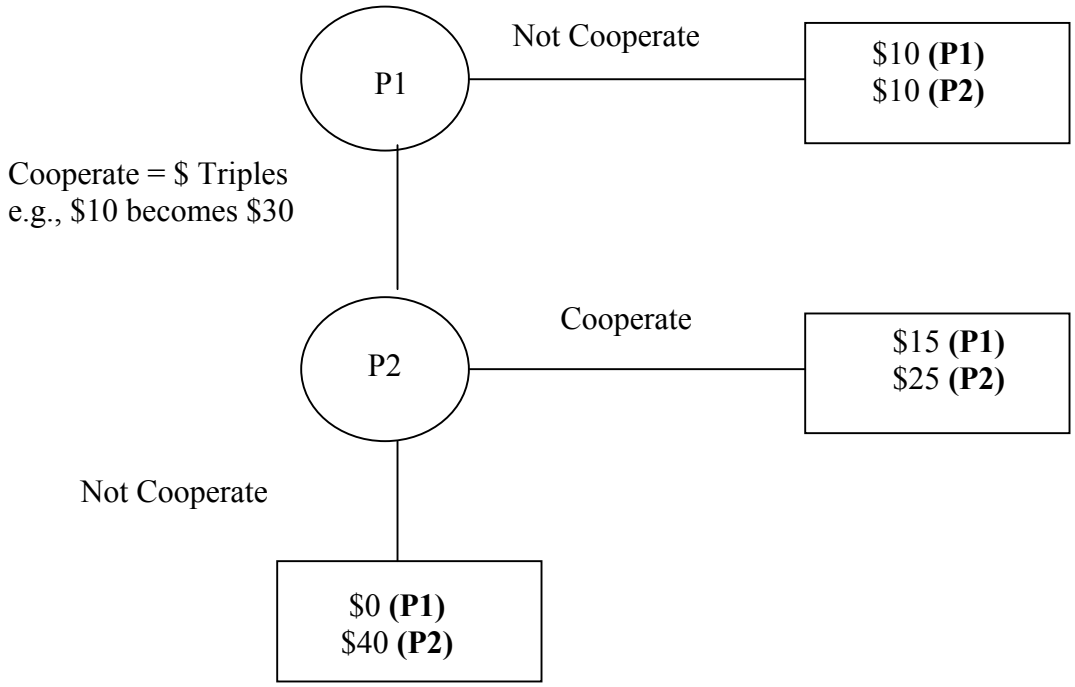


Figure 1.2. The $10 Trust Game devised by Berg et al. (1995). Figure adapted from Gunnthorsdottir et al. (2002, p. 52).

decide to keep the entire tripled amount (e.g., $0 for P1 and $40 for P2). If P2 decides the former, he or she moves to the right along the decision tree. However, if P2 decides the latter, he or she moves down along the decision tree and retains the entire tripled amount.

As aforementioned, according to economic behaviour theory, rational individuals are assumed to behave in a self-interested manner (Berg et al., 1995). By that assumption, most P1s will move to the right in anticipation of P2s defecting (i.e., moving down to obtain the entire amount of tripled money). However, most studies that have employed the $10 Trust Game have found that a significant number of P1s will entrust their opponent with at least some of their $10 show-up fee and that most P2s will reciprocate at least some of the received tripled money (Berg et al., 1995; Camerer, 2003). These results were obtained in studies where the game was played only once (i.e., "one-shot games") and anonymously between two individuals, thereby presenting no opportunity for retribution by either party for not cooperating (Berg et al., 1995). More specifically, one study by McCabe and Smith (2000), using undergraduate students as participants, found that 50% of P1s cooperated by moving down and that 75% of P2s reciprocated by moving right (see Figure 1.3). P1s who cooperated made somewhat more on average than P1s who did not cooperate ($11.25 vs. $10).

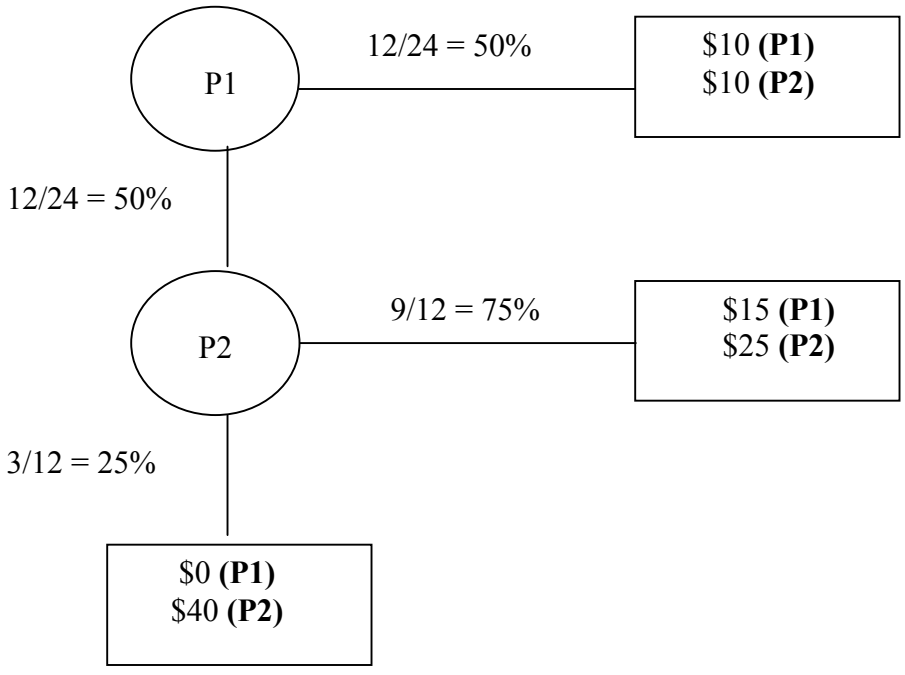


Figure 1.3. Frequency of participants' moves as Player 1 (P1) and Player 2 (P2) in Berg et al. (1995). Reproduced from Gunnthorsdottir et al. (2002, p. 52).

Returning to the study by Gunnthorsdottir et al. (2002), these researchers examined whether differences in individuals' levels of Machiavellianism could explain corresponding individual differences in trust and reciprocity using the $10 Trust Game (Berg et al., 1995). The game was played once with an anonymous opponent. Given that Machiavellians are described as manipulative, unemotional, and lacking regard for others' well-being, the researchers hypothesized that high Machs would defect more often as P2s than low Machs. However, they did not make specific predictions about the behaviour of high Machs as P1s because high levels of Machiavellianism have been associated with both cynicism, which would prompt non-cooperation, and risk-seeking, which would prompt the riskier decision of moving down (i.e., cooperation). Indeed, no significant differences were observed between average-low (AL) and high (H) Machs in their decisions as P1 (see results in Figure 1.4). In contrast, significant differences were found between the two groups in the P2 position, with 54.2% of the AL group

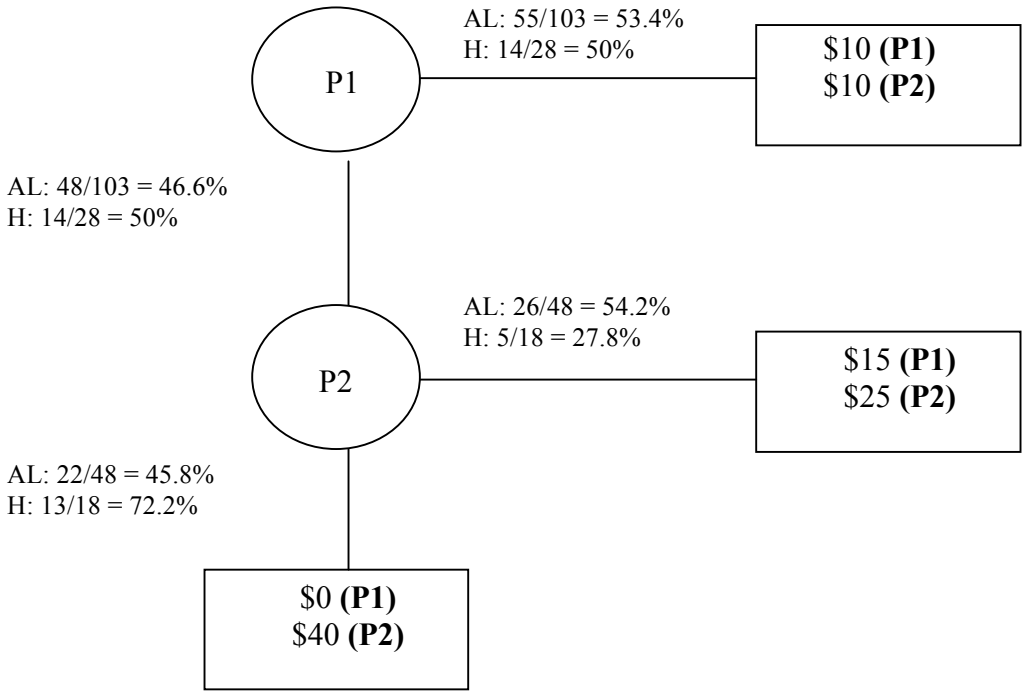


Figure 1.4. Frequency of participants' moves as Player 1 (P1) and Player 2 (P2) in Gunnthorsdottir et al. (2002). H = high and AL = average to low Mach-IV scores. Reproduced from Gunnthorsdottir et al. (2002, p. 61).

choosing to cooperate (i.e., reciprocate) and 72.2% of the H group choosing to defect (i.e., keep all of the sent money). Thus, the authors concluded that the Mach-IV scale was able to predict trustworthiness or reciprocity but not trusting behaviour, with higher scores being associated with lower levels of trustworthiness.

The Present Study

Research Questions and Hypotheses

As aforementioned, though psychopaths are described as unusually adept liars in the clinical literature and media, there exists a paucity of empirical data to support this claim and in fact the majority of the available empirical research tends to contradict it (Cogburn, 1993, Patrick & Iacono, 1989; Raskin & Hare, 1978; Verschuere et al., 2007). Other fundamental questions with respect to the nature of lying behaviour in psychopaths have yet to be explored empirically. Chief among these questions is whether psychopaths actually lie more often than nonpsychopaths, as claimed[3] (Cleckley, 1976; Hare, 1991a; 1993; 2003; Hare et al., 1989). This is an important question to examine because the mere possibility that psychopaths pursue lying behaviour more frequently than nonpsychopaths could explain why they appear to be more successful at lying over time, even if their overall rate of successful lying is in fact unexceptional (Billings, 2004).

The present study examined this question in individuals who were high and low on psychopathic tendencies using a modified version of the $10 Trust Game by Berg et al. (1995). Specifically, the $10 Trust Game was modified to allow participants the opportunity to choose to lie or tell the truth to an anonymous individual, resulting in an improvement upon methodologies used in previous studies in the psychopathy and lying literature, which tended to prescribe when participants could lie or tell the truth. Given the popular claim that psychopaths are prolific liars and manipulators, it was hypothesized that individuals scoring higher on psychopathic tendencies would lie more frequently than those who scored lower on psychopathic tendencies.

Another important and fundamental question examined in the present study was: Whom do individuals who are higher on psychopathic tendencies attempt to deceive? More specifically, the present research investigated whether lying frequency changed in individuals who were

[3] This is also an issue that has garnered little empirical attention within the Machiavellian literature, with extant studies showing inconclusive findings.

higher on psychopathic tendencies in the modified $10 Trust Game as a result of having met compared to not having met their opponents. Both Hare (1991a; 2003) and Cleckley (1976) have claimed that psychopaths are compulsive liars, who will lie to strangers and acquaintances alike. However, this claim has also not been empirically investigated. Thus, based on clinical lore, it was hypothesized that the lying frequency of individuals who scored higher on psychopathic tendencies would be consistent whether they had had the opportunity to have met and interacted with an opponent or not.

The third question addressed in the present research was whether individuals who were higher on psychopathic tendencies would be more likely to lie to a greater degree or severity than those who were lower on psychopathic tendencies. To date, there appears to be an absence of studies in the psychological literature that have examined this issue. On the other hand, the Machiavellian literature contains studies that have found that high Machs are more willing and more likely to fabricate bigger lies than low Machs (Geis, Christie, & Nelson, 1970). As well, high Machs have also been found to be more likely to steal greater amounts of money on average from a trusting compared to a visibly suspicious individual than low Machs (Harrel & Hartnagel, 1976). Based on these findings and given the similarities between Machiavellian and psychopathic individuals as well as the clinical observation that psychopaths lack empathy and derive enjoyment from lying, it was hypothesized that individuals who were higher on psychopathic tendencies would lie to a greater degree than those who were lower on psychopathic tendencies.

The fourth question examined in the present research was whether lying frequency and lying severity would change over the course of repeated interactions for individuals who were higher on psychopathic tendencies compared to those who were lower on psychopathic tendencies. Again, to date, this question has not been empirically investigated, though case studies have suggested that psychopathic individuals may make favourable initial impressions only to cause doubt and mistrust in others over the long-term (Babiak, 1995). Similarly, this question has not received any empirical attention within the Machiavellianism literature (Wilson et al., 1996). Wilson et al. (1996) argued that high Machs were less likely to succeed in long-term interactions than low Machs given their propensity to deceive and thus would elicit distrust in others over time. Within the context of non-zero-sum games, they proposed that high Machs, armed with the knowledge about whether they would be playing a single versus repeated game,

would be more likely than low Machs to behave strategically different in the two situations. Specifically, they hypothesized that high Machs would defect in one-shot games but cooperate initially and defect on later trials in repeated games, while low Machs would be less likely to distinguish between the two situations and would cooperate in both. Thus, given that psychopathic individuals, like Machiavellians, are described as masterful liars and manipulators, it was hypothesized in the present research that higher scores on psychopathy measures would be associated with higher rates and a greater degree of lying in later but not initial interactions in a repeated game.

The fifth question examined in the present research was whether there would be sex differences in lying behaviour between those who were higher compared to those who were lower on psychopathic tendencies. Psychometrically speaking, males have consistently been found to be more Machiavellian (Christie & Geis, 1970; Gunnthorsdottir et al., 2002) and more psychopathic than females (Dollan & Völlm, 2009; Forth, Brown, Hart, & Hare, 1996) both in number and degree. Consequently, male participants have been the focus in the preponderance of Machiavellian and psychopathy research. Of the few existing studies in the psychopathy literature that have used non-zero-sum games, none have included female participants (Curry et al., 2011, Mokros et al., 2008, Rilling et al., 2006). Interestingly, sex differences in lying behaviour within the context of non-zero-sum games have been examined somewhat outside of the psychological literature, specifically within the field of economics, though results have been mixed. Specifically, Dreber and Johannesson (2008) found that males were significantly more likely than females to lie over competition for financial gain within anonymous interactions while Aoki, Akai, and Onoshiro (2010) did not. Thus, due to the lack of direct previous research from which to draw, it was difficult to hypothesize whether or not sex differences would emerge within the modified $10 Trust Game employed in the present study, though it was hypothesized, based on findings from previous research, that males would score higher on Machiavellianism and psychopathy than females. As well, it was difficult to hypothesize whether or not males who were higher on psychopathic tendencies would differ from females who were higher on psychopathic tendencies with respect to lying frequency overall and in the context of different types of interactions (i.e., having met compared to not having met their opponent).

Lastly, the present research examined whether certain characteristics of self-reported lying behaviour were related to behaviour within the modified $10 Trust Game, and to

psychopathy/Machiavellianism. Specifically, the relationships amongst self-perceived lying ability, lying frequency, affective responses after successful deception and lying in the game, as well as scores in psychopathy/Machiavellianism were examined. Given that grandiosity is described as a characteristic feature of psychopathy (Hare, 1996), it was hypothesized that individuals who were higher on psychopathic tendencies would be more likely to report higher levels of lying ability than those who were lower on psychopathic tendencies.

CHAPTER 2

METHOD

Participants

Participants were recruited from the Introductory Psychology participant pool at the University of Saskatchewan (U of S). All participants received credit towards their final course grade, as well as the opportunity to enter into a draw for an 8GB iPod music player.

Apparatus and Design

Two computer applications were created through a PHP (Hypertext Preprocessor) script to run a modified version of the $10 Trust Game on a laptop computer, one for the Player 1(P1) side of the game and the other for the Player 2 (P2) side. Each participant played 10 trials of the game first as P1 followed by another 10 trials as P2. This sequence was later repeated (i.e., they played the game again as P1 for 10 trials and as P2 for another 10 trials). Thus, they played 20 trials in total as P1 and 20 trials in total as P2. Participants used the computer keyboard and mouse to enter and record their decisions.

The $10 Trust Game used in the present study, which will hereafter be referred to as the Lying Game, was modeled on the game devised by Berg et al. (1995) with several modifications (see Figure 2.1). First, as mentioned, participants played the game over repeated trials with each opponent. This differed from Berg et al. (1995), in which the game was played over only one trial with each opponent. This change provided participants with ample opportunity to lie, thereby allowing for the observation of lying frequency and severity over time.

Second, the game was modified to provide P1s with the opportunity to report honestly or dishonestly about the amount of money that they were giving to P2s, thus providing them with an opportunity to lie or tell the truth about the amount of money given. Participants were provided with $10 in virtual money at the start of each trial, which was displayed in the top portion of the computer screen. Participants were informed that each dollar accumulated by the end of the experiment would be equivalent to one entry into the draw for the iPod music player. Therefore, making more money in the game resulted in more entries, thereby increasing an individual's chances of winning the draw.

The computer screen displays for P1s and P2s differed as these roles involved making different types of decisions. When participants assumed the role of P1, the initial screen display included two fields, one labeled "disclosed amount" and the other labeled "actual amount." Participants could enter any dollar amount between $0 and $10 in each of these fields. They were instructed to enter the amount that they wished to *tell* P2s that they were giving to them in the "disclosed amount" and to enter the amount that they *actually* wished to give to P2s in the "actual amount." Thus, these amounts could match, which meant that the participant was telling the truth or they could differ, which meant that the participant was lying. The difference between these two amounts represented the magnitude of lying severity (i.e., the greater the difference the greater the degree of lying). Any amount between $1 and $10 that was entered in the "disclosed amount" field would propel the game forward (i.e., moving down on the decision tree for P1 in Figure 2.1) while entering $0 in this field would end the trial resulting in both players retaining their original $10 (i.e., moving to the right on the decision tree for P1 in Figure 2.1).

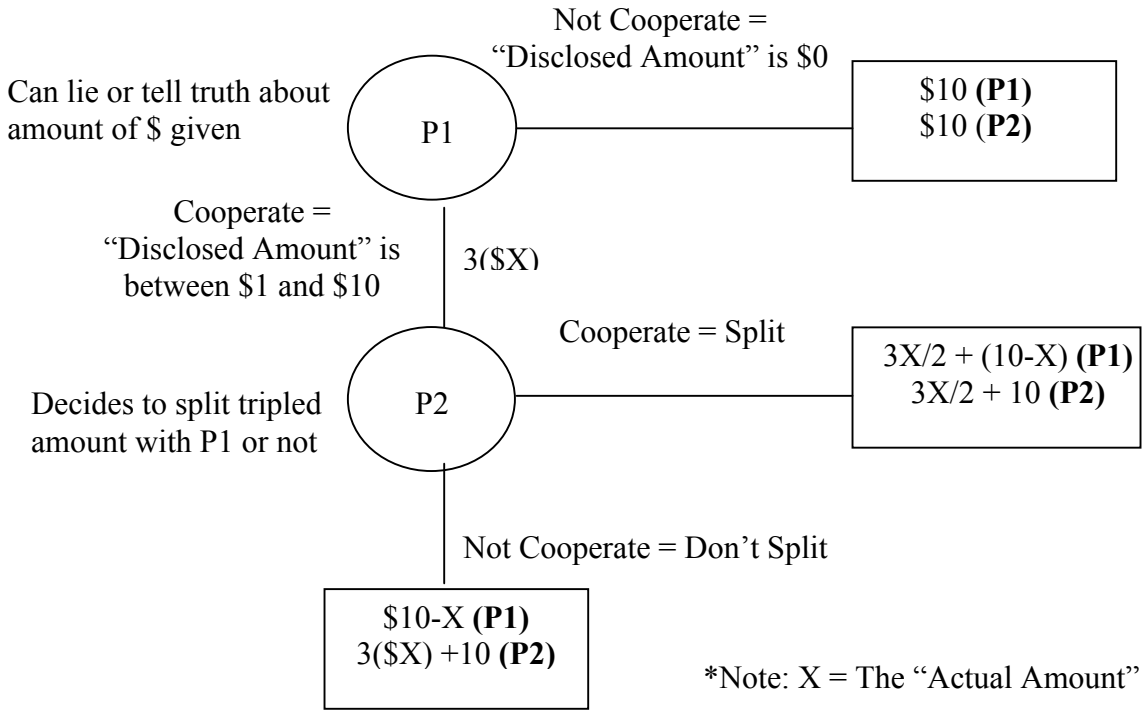


Figure 2.1. A modified version of the $10 Trust Game (i.e., The Lying Game) designed for use in the present study. Figure adapted from Gunnthorsdottir et al. (2002).

When participants assumed the role of P2, the initial screen display included only P1s' (i.e., the computer's) "disclosed amount," which was a randomly selected number between $1 and $10. Participants were aware that P1s could lie or tell the truth about the offer made in the "disclosed amount" and that the "actual amount" would be revealed to them only after they had finalized their decision either to split evenly (i.e., cooperate; moving to the right on the decision tree for P2 in Figure 2.1) or keep (i.e., not cooperate or defect; moving down on the decision tree for P2 in Figure 2.1) the entire offered amount by P1. Participants were also aware that final calculations for each trial would be based on what had been entered by P1 in the "actual amount" multiplied by a factor of 3 (i.e., tripled) and not the "disclosed amount."

The third difference between the design of the present game and that of Berg et al. (1995) was that participants always played against a computer, although they were informed that each new opponent was another undergraduate Introductory Psychology student. The computer was programmed to use a dummy strategy (i.e., a pre-programmed strategy). Thus, when participants assumed the P1 role, P2 (i.e., the computer) responded in a standardized manner in accordance with P1's actions (i.e., lie or tell the truth). Similarly, when participants assumed the P2 role, P1 (i.e., the computer) responded in a standardized manner in accordance with P2's actions (i.e., split or keep the money). This modification allowed for increased experimental control.

Specifically, the computer employed a tit-for-two-tats strategy, as was the case in Mokros et al. (2008), described earlier, who used the same strategy in a computerized version of the Prisoner's Dilemma Game. That is, initially, the computer as P2 would cooperate (i.e., split the tripled amount) with participants in the P1 role, and would continue in this manner unless the participant lied (i.e., "disclosed" and "actual" amounts contained different values) twice in a row. If this occurred, the computer would defect (i.e., keep all of the tripled amount) on the next trial and on all subsequent trials until the participant told the truth (i.e., both "disclosed" and "actual" amounts contained the same values), at which point the computer would return to cooperating on the next trial until the participant again lied twice in a row. Similarly, when roles were reversed, the computer as P1 would initially tell the truth to participants in their role as P2 and would continue in this manner unless the participant defected (i.e., did not split the money) twice in a row. If this occurred, the computer would begin to lie (in which case, the "disclosed amount" would always be greater than the "actual amount") on the next trial and on all subsequent trials

until the participant cooperated (i.e., split the money), at which point the computer would return to telling the truth until the participant again defected twice in a row.

Tit-for-two-tats is a more liberal strategy (i.e., encourages more cooperation) than is tit-for-tat, where the computer cooperates on the first trial and subsequently matches the previous move of the participant, because it does not immediately punish defection, thereby evading provocation of the participant. In this way, tit-for-two-tats discourages participants from entering into an endless succession of retributions or "an eye for an eye"-type play sequences, as is common in tit-for-tat (Kollock, 1993).

Measures

Levenson Self-Report Psychopathy Scale (LSRP). The LSRP (Levenson, Kiehl, & Fitzpatrick, 1995; see Appendix A) is a valid and reliable measure (Brinkley, Schmitt, Smith, & Newman, 2001; McHoskey et al., 1998) of psychopathic tendencies in nonforensic populations. It is a 26-item self-report measure to which individuals respond on a 4-point Likert scale, where 1 = Disagree Strongly and 4 = Agree Strongly. It consists of two subscales, the primary psychopathy scale and the secondary psychopathy scale. The first scale was designed to assess the interpersonal aspects of psychopathy (e.g., selfishness, manipulativeness, etc.) and the second was designed to assess the behavioural aspects of psychopathy (e.g., impulsivity, irresponsibility, etc.). The LSRP has been found to correlate significantly with the PCL-R (r = .35; Brinkley et al. 2001).

Psychopathic Personality Inventory – Revised (PPI-R). The PPI-R (Lilienfeld & Widows, 2005) is a 154-item self-report measure designed to assess psychopathic tendencies in nonforensic populations. Participants respond by selecting the degree to which each statement applies to them (i.e., 1 = False; 2 = Mostly False; 3 = Mostly True; 4 = True). The measure consists of eight subscales (i.e., Machiavellian Egocentricity; Rebellious Nonconformity; Blame Externalization; Carefree Nonplanfulness; Social Influence; Fearlessness; Stress Immunity; and Coldheartedness). Poythress, Edens, and Lilienfeld (1998) found the original PPI, which consisted of 187 items, of which many are nearly identical to those of the PPI-R, to be significantly correlated with the PCL-R (r = .54). More recently, the PPI-R has been found to correlate significantly with the Self-Report Psychopathy Scale (2nd Edition; Hare, 1991b, as cited in Lilienfeld & Widows, 2005) at r = .82 and r = .70 in college and offender samples, respectively.

Mach-IV Scale. The Mach-IV scale (Christie & Geis, 1970) is the most widely used measure of Machiavellianism. It consists of 20 items to which individuals respond on a 5-point Likert scale, where 1 = Strongly Agree and 5 = Strongly Disagree (McHoskey et al., 1998; see Appendix B). The items were designed to measure a respondent's tendency toward behaviours typically associated with Machiavellianism, such as, a propensity toward manipulative behaviour and cynicism.

Post-Experiment Questionnaire – Part 1. The first part of this questionnaire was developed to serve as a manipulation check and to collect demographic information about participants to inform data analyses. Open-ended questions were posed to ascertain whether participants were aware of the true purpose of the study, that they had been playing against a computer program rather than another individual, and whether they had previously met any of the other participants (i.e., confederates) in the study (see Appendix C for the Pilot Testing version of the questionnaire).

Post-Experiment Questionnaire – Part 2. The second part of this questionnaire consisted mostly of questions directly drawn from Klaver et al. (2007). The questions were generally close-ended in nature and solicited participants' self-perceived lying frequency and ability (see Appendix D for the Pilot Testing version of the questionnaire).

Pilot Testing

Pilot testing was initiated prior to conducting the main study in order to assess the feasibility of the study design and procedures, and whether further refinement of these aspects were necessary. Only female participants were recruited for the pilot testing (the reason for this is described in greater detail in the Procedure section below).

Procedure

Prior to data collection, ethical approval for the project was obtained from the University of Saskatchewan Behavioural Research Ethics Board. After this, a recruitment announcement was placed on the Introductory Psychology participant pool website via the Department of Psychology at the U of S. The announcement included information about the purpose of the study (i.e., that the study investigated the effects of gender and personality on decision-making; the actual purpose of the study was concealed until debriefing), what participation involved (i.e., about one hour of participation time, during which one would complete a computer task and several personality questionnaires) and how participants would be compensated for their time

(i.e., two research credits, equivalent to 2% of their final psychology course grade, and the opportunity to enter into a draw for an 8GB iPod music player). After reading the description, any interested individuals were instructed to contact the researcher by email to schedule a participation time.

Given that sex differences in lying behaviour was being investigated in the present research, the sex of all confederates in the waiting room was kept consistent with that of the participants' to circumvent the possible confounding effects of mixed-gender dynamics. Due to difficulties in enlisting male confederates, only female participants were recruited for the pilot testing.

Upon arrival at the laboratory, participants reviewed the consent form (see Appendix E) and were provided with the opportunity to ask questions. Following consent procedures, participants were presented with the instructions to the Lying Game (i.e., a modified version of the $10 Trust Game), described above. The researcher reviewed the instructions with the participant and clarified any uncertainties. As an incentive to completing the task, participants were also informed that each dollar they earned in the game by the end of the experiment would correspond to one entry into the draw for the iPod music player.

The study consisted of two conditions. All participants were tested individually and partook in both conditions. Condition 1 will hereafter also be referred to as the Non-Exposure Condition while Condition 2 will hereafter also be referred to as the Exposure Condition. The order of the Non-Exposure and Exposure Conditions were counterbalanced across participants.

Condition 1 – The Non-Exposure Condition. Once it was clear that participants understood the instructions of the game, the researcher exited the testing room and participants played the game over 10 trials as P1 (see Appendix F for instructions). They were informed that P2 was another undergraduate Introductory Psychology student playing the game in another room in the building. As aforementioned, P2 was, in reality, a computer employing a tit-for-two-tats strategy.

After the 10 trials were completed, participants were presented with a prompt on the computer screen instructing them to inform the researcher that they had completed the trials by opening the lab door and leaving it slightly ajar. Upon seeing this indication, the researcher entered the testing room and provided participants with the instructions to the game as P2 (see Appendix G). At that time, participants were informed that they would face a new opponent, a

different undergraduate Introductory Psychology student, who was again, in fact, a computer with pre-programmed responses. This information (i.e., that participants would play a new opponent) was intended to decrease participants' inclination, if any, toward retribution against as well as any possible ingratiating behaviour (i.e., for offending) toward the same opponent.

Once participants were clear on their role as P2, the researcher set up the P2 game application. Participants were instructed to notify their new opponent when they were ready to begin the game by clicking "OK" on the pop-up menu displayed on the screen. The researcher would then leave the room and participants played the game over 10 trials as P2. Again, participants were prompted to inform the researcher when they had completed the 10 trials by opening and leaving the lab door slightly ajar. When the researcher received this indication and returned to the room, participants were informed that they would be taken to a waiting room with other participants while the researcher set up the computer applications for the second part of the computer task (i.e., Condition 2 – the Exposure Condition; see Appendix H for researcher's script).

Condition 2 – The Exposure Condition. For participants starting with the Exposure Condition, once it was clear that they understood the game instructions for P1 (see Appendix I), they were informed that they would be taken to a room to wait with other participants while the researcher set up the computer applications for all of the participants in the study.

In the waiting room, participants were introduced to three other participants (actually confederates; see Appendix J for researcher's script) and informed which out of the three would be their opponent (i.e., P2) for the first game and which out of the remaining two would be their opponent (i.e., P1) for the second game. The third confederate was placed in the room to help convince participants that several games were being played simultaneously. Participants were provided with the opportunity to interact with their opponents for a period of five minutes. At the end of the five-minute period, the researcher returned to the waiting room to collect the participant and the participant's first "opponent." The researcher informed them that the computers were set up for the game and that the "opponent" should proceed to an upstairs testing room while the researcher continued to a different testing room with the participant. After waiting a couple of minutes with the participant to allow their "opponent" to get to the testing room and settle in, the researcher exited the room to allow the participant to play 10 trials of the game as P1. Upon completion, the researcher reviewed the P2 game instructions (see Appendix

K) with participants and set up the game. Participants were again informed that they would play 10 trials of the game with one of the other "participants" that they had met in the waiting room.

Once all computer trials were completed, participants filled out the LSRP, PPI, and Mach-IV scale. The order of these measures was randomized to offset any order effects. After this, participants completed the Post-Experiment Questionnaire – Part 1 followed by the Post-Experiment Questionnaire – Part 2. After all measures were completed, participants were debriefed on the purpose of the study (see Appendix L for Debriefing Form) and provided with the opportunity to ask questions.

Main Study

To resolve issues that arose during the pilot testing, several changes to the methodology were implemented in the main study. These changes are reported below.

Participants

Participants were recruited from the Introductory Psychology participant pool at the U of S. All participants received credit towards their final course grade, as well as the opportunity to enter into a draw for an 8GB iPod music player.

As a result of the disproportionate number of female compared to male students enrolled in Introductory Psychology courses, male students at the U of S outside of the Introductory Psychology participant pool were also recruited for the present study. All participants received the opportunity to enter into a draw for an 8GB iPod music player or two football tickets to watch a game involving the Canadian Football League team based in the province, which was approximately of equivalent value to the iPod.

Apparatus and Design

All aspects of the apparatus and design described above remained unchanged in the main study. However, due to the aforementioned difficulty in securing the assistance of male confederates, as well as problems in coordinating the schedules of female confederates, the waiting room scenario was replaced with pre-recorded video greetings of confederates.

Two male and two female confederates each recorded short personal greetings on a webcam. The structure of the greeting included the individual's first name, city of origin (i.e., Saskatoon), year and program of study (i.e., first year of Arts and Science), and a favourite past time (e.g. playing the violin, running, etc.). The two male confederate video greetings were

employed and presented in the same order for all male participants and the two female confederate video greetings were employed and presented in the same order for all female participants.

Measures

The measures employed in the main study were identical to that of the pilot testing, although a couple of questions in the Post-Experiment Questionnaire – Part 1 (see Appendix M) were slightly revised to accommodate the change in design. As well, several questions were added to collect additional information about participant demographics.

Procedure

Due to the modifications in the study design and procedures, ethical approval for the revised protocol was obtained from the University of Saskatchewan Behavioural Research Ethics Board prior to data collection. After this, a recruitment announcement containing a description of the study was placed on the Introductory Psychology participant pool website via the Department of Psychology at the U of S. After reading the description, any interested individuals were able to sign-up for available study timeslots directly on the website. In addition to recruitment from the participant pool, male students were also recruited from various academic departments on campus. Specifically, recruitment flyers containing similar information as on the website were placed in visible locations in the Arts, Business, Kinesiology, Computer Science, and Computer Engineering departments, as well as other high-trafficked areas across the university.

Upon arrival at the laboratory, participants reviewed the (slightly revised) consent form (see Appendices N and O) and were provided with the opportunity to ask questions. Following consent procedures, the researcher reviewed the instructions to the modified $10 Trust Game with participant and clarified any uncertainties. As an incentive to completing the task, participants were also informed that each dollar they earned in the game by the end of the experiment would correspond to one entry into the draw.

The study consisted of two conditions, Non-Exposure and Exposure, which were introduced earlier. All participants were tested individually and partook in both conditions, the order of which was counterbalanced across participants.

Condition 1 – The Non-Exposure Condition. The procedure in this condition remained primarily the same from the above. One exception was that while explaining the game to participants, the researcher emphasized that they would be playing individuals from different

participant pools (i.e., not from the Introductory Psychology participant pool). This change was made due to one participant expressing suspicion that there was only one available time slot available per hour for sign-up on the participant pool website when participants were supposedly playing a number of different opponents in the study. The other change in the procedure from the pilot testing was that after participants had completed the 20 trials of the game (i.e., as P1 and as P2), the researcher delivered a slightly modified introduction to the next part of the study due to the procedure changes in the Exposure Condition (i.e., Condition 2; see Appendix P for researcher's script)

Condition 2 – The Exposure Condition. As in the Non-Exposure Condition, during the course of reviewing the game instructions in the Exposure Condition, the researcher emphasized that participants would be playing individuals from different participants pools (i.e., not from the Introductory Psychology participant pool). Once it was clear that participants understood the game instructions, they were presented (see Appendix Q for researcher's script) with a personal video greeting from their opponent (i.e., a same-sex confederate). Participants were then instructed to record their own personal greeting on a webcam to share with their opponent. They were advised to disclose whatever and however much information they were comfortable with their opponent knowing about them. After this, the researcher left the room while participants recorded their greetings. After the video was recorded and reviewed together by the participant and researcher, the participant was instructed to wait several minutes before clicking "Ok" to start the game, as this would provide the researcher with sufficient time to reach the other individual (i.e., confederate) and show them the participant's video greeting. This ruse was intended to add credibility to the account that participants were playing other individuals and not a computer program. After several minutes, the researcher returned to ensure that participants had started the game before leaving them to finish the 10 trials as P1. Once participants had completed the trials, they were prompted via a computer message to notify the researcher, again by opening and leaving the lab door slightly ajar. When the researcher returned, participants were presented with another personal video greeting from a different opponent (also a same-sex confederate) and told that this opponent had already viewed their previously recorded greeting. After this, participants played the game again, this time as P2.

Upon completing both conditions, participants filled out the three personality measures, the order of which were randomized across participants. This was followed by completion of the

Post-Experiment Questionnaire – Part 1 and the Post-Experiment Questionnaire – Part 2. As an additional manipulation check, participants were briefly interviewed after the paper-and-pencil measures. They were asked 1) how they had found the study generally, 2) whether they believed that they had received all of the information at the start of the study, 3) whether they had found the other participants (i.e., their "opponents") to be honest, and 4) whether they had found the researcher to be honest. These questions were intended primarily to verify that participants had not realized that they had been playing a computer program. After this, participants were debriefed on the true purpose of the investigation, informed about the use of deception in the study, the rationale for its use (see Appendix L for Debriefing Form, which was the same one as in the pilot testing), and provided with the opportunity to ask questions.

CHAPTER 3

RESULTS

Pilot Testing

Descriptive Analyses

Participants. Due to difficulties in recruiting male confederates for the waiting room scenario and the need to maintain gender congruence between participants and confederates, only females were included in the pilot study. In total, 14 female participants were recruited via the University of Saskatchewan (U of S) Introductory Psychology participant pool website. Participants ranged in age from 17 to 45 years old, with a mean age of 22.71 years (*SD* = 7.07). Other demographic information was not collected in this sample.

Psychopathy and Machiavellianism Measures. In terms of the means for the PPI-R, LSRP, and Mach-IV Totals, these were 318.36 (*SD* = 35.98), 45.71 (*SD* = 8.774), and 52.21 (*SD* = 8.182), respectively. These data were added to the questionnaire data from the main study and the combined data were compared to existing norms, which are reported in the section below.

The Lying Game. As a result of computer error, data from the game were lost and thus could not be reported.

Main Study

Prior to statistical analyses, data were cleaned and checked in accordance with procedures outlined in Tabachnick and Fidell (2007). Z-scores for skewness and kurtosis were calculated to assess normality for all analyses and these values were determined to be within acceptable limits. An alpha level of .05 was used for all statistical tests. As well, Cohen's (1988) general guidelines were used for the reporting of small (*d* = 0.20), medium (*d* = 0.50), and large effect sizes (*d* = 0.80).

Descriptive Analyses

Participants. 150 undergraduate students from the U of S, 87 females and 63 males, participated in the main study. The majority of participants were in their first year of university studies (70,7%; second year = 11.3%; third year = 9.3%; fourth year = 4.7%; fifth year or higher = 4.7%) in the Arts and Science program (70.7%; Business = 9.3%; Other = 20%), and Caucasian (71.3%; Asian = 22.7%; Other = 6%).

Psychopathy and Machiavellianism Measures. A series of independent-samples t-test comparisons were computed to determine whether any differences existed on the self-report psychopathy and Machiavellianism measures between female participants in the pilot testing and those in the main study. After controlling for multiple comparisons using the Bonferroni correction ($\alpha = 0.0125$), no significant differences were found between the two samples on Mach-IV and LSRP total scores, $t(96) = -.389$, $p = .70$ and $t(96) = -1.18$, $p = .24$, respectively. However, independent-samples *t*-test analyses were also computed for the PPI-R total scores based on age and one significant difference was found between the two groups of participants falling within the 25 - 29 age range, $t(4) = -.786$, $p = .001$. As such, the two female participants in the pilot testing falling within this age range were excluded from further analyses. Additionally, one participant falling within the 40 - 49 age range from the pilot testing was also removed from further analyses due to a lack of an age-matched counterpart for comparison in the main study. The rest of the self-report data from the pilot testing were combined with those from the main study.

Once the questionnaire data were combined, further analyses led to the exclusion of data from another 10 participants, five for high scores on the Inconsistent Responding subscale of the PPI-R (i.e., three males and two females) and another five for disclosing their suspicion that they were playing a computer program rather than other undergraduate students during the computer task (i.e., four males and one female). Thus, a total of 151 participants, 95 females and 56 males, were included in the analyses of the PPI-R data. The total number of female participants included in the analyses of the Mach-IV and LSRP data was the same. However, the total number of male participants on these two measures decreased by one due to an administration error (i.e., 150 in total, 95 females and 55 males). Further, the amount of missing data for each participant was calculated and determined to be within acceptable limits (i.e., less than 5%). Participants with missing data were excluded from analyses on a pairwise (i.e. analysis-by-analysis) basis.

In order to assess the psychometric properties of the measures, correlations between the psychopathy and Machiavellianism measures, as well as the intercorrelations between subscales on the LSRP and PPI-R were conducted prior to the main analyses and are displayed in Table 3.1. As can be seen, the three measures were all significantly and positively correlated between

Table 3.1. Correlations Between All Measures and Intercorrelations Between Subscales

Measure/ Scale	Mach-IV Total[a]	LSRP Total[a]	PP	SP	PPI-R Total	ME	RN	BE	CN	SOI	F	STI
LSRP Total	.645**	-										
PP	.650**	.898**	-									
SP	.347**	.713**	.332**	-								
PPI-R Total	.391**	.523**	.473**	.368**	-							
ME	.549**	.749**	.784**	.357**	.507**	-						
RN	.224**	.338**	.201*	.404**	.697**	.220**	-					
BE	.357**	.445**	.266**	.530**	.420**	.316**	.295**	-				
CN	.291**	.512**	.254**	.692**	.551**	.294**	.553**	.351**	-			
SOI	-.036	-.043	.068	-.200*	.498**	.143	.219**	-.010	-.070	-		
F	.072	.098	.107	.038	.643**	.114	.490**	.102	.130	.416**	-	
STI	-.022	-.107	-.023	-.191*	.404**	-.057	.104	-.280**	.021	.233**	.301**	-
C	.408**	.442**	.504**	.145	.429**	.407**	.078	.052	.304**	-.059	.056	.243**

Note. PP = Primary Psychopathy; SP = Secondary Psychopathy; ME = Machiavellian Egocentricity; RN = Rebellious Nonconformity; BE = Blame Externalization; CN = Carefree Nonplanfulness; SOI = Social Influence; F = Fearlessness; STI = Stress Immunity; C = Coldheartedness.

$n = 151$ except for [a]$n = 150$.

*$p < .05$. **$p < .01$ level.

the LSRP and Mach-IV $r = .645$; between the PPI-R and Mach-IV $r = .391$; and between the PPI-R and LSRP $r = .523$ (all ps $< .01$). The two subscales on the LSRP were also significantly correlated with $r = .332$, $p < .01$. The intercorrelations between the eight PPI-R subscales ranged from -.059 to .553. While a few were negatively correlated, the large majority of the intercorrelations between PPI-R subscales were significant and positive, and fell within the small to moderate range.

The internal consistencies (Cronbach's Alpha) of all measures and subscales are displayed in Table 3.2. Cronbach's alphas for the Mach-IV, LSRP, and PPI-R Total scores ranged from .76 to .90. The two subscales, Primary Psychopathy and Secondary Psychopathy, of the LSRP had coefficient alpha estimates of .83 and .70, respectively, while the eight subscales on the PPI-R were also all internally consistent, with Cronbach's alphas ranging from .80 to .90.

Table 3.2. Internal Consistencies of All Measures and Subscales

Measure	No. of Items	Cronbach's α
Mach-IV Total	20	.76
LSRP Total	26	.82
LSRP Primary Psychopathy	16	.83
LSRP Secondary Psychopathy	10	.70
PPI-R Total	154	.90
Machiavellian Egocentricity (ME)	20	.82
Rebellious Nonconformity (RN)	16	.84
Blame Externalization (BE)	15	.85
Carefree Nonplanfulness (CN)	19	.84
Social Influence (SOI)	18	.90
Fearlessness (F)	14	.85
Stress Immunity (STI)	13	.87
Coldheartedness (C)	16	.80

Table 3.3 displays the mean total scores overall, as well as for males and females separately, on the Mach-IV, LSRP, and PPI-R. The maximum possible scores on the Mach-IV, LSRP, and PPI-R were 100, 78, and 616, respectively. Consistent with expectations, males scored higher than females on the Mach-IV, $t(92) = -3.89$, $p < .001$, $d = .680$; LSRP, $t(86) = -2.11$, $p = .019$, $d = .374$; and PPI-R, $t(149) = -5.05$, $p < .001$, $d = .851$ (all p values one- tailed), thus indicating higher levels of Machiavellianism and psychopathic tendencies in males than in females.

To place these results into context, they were compared to results from previous studies. Specifically, McHoskey et al. (1998) used the Mach-IV and found overall mean Mach-IV Total scores ranging from 54.7 to 55.7 across three separate university samples consisting of both male and female participants while Billings (2004) found an overall mean of 51.68 ($SD = 8.51$) also using a mixed male and female university sample; these means are comparable to the overall mean of 52.67 (10.09) that was found in the present study. For the LSRP, Poythress et al. (2010) used the measure with an offender sample (80% male and 20% female) and found a mean of 55.84 ($SD = 11.69$), which, as would be expected, is somewhat higher than the overall mean of 47.35 ($SD = 9.32$) that was found in the present sample of university students.

Table 3.3. Mean Mach-IV, LSRP, and PPI-R Totals

Measure	Females (*SD*) ($n = 95$)	Males (*SD*) ($n = 55$)	Overall (*SD*) ($n = 150$)
Mach-IV Total	50.20_a^{**} (8.64)	56.93_b^{**} (11.03)	52.67 (10.09)
LSRP Total	46.03_a^{*} (7.88)	49.62_b^{*} (11.11)	47.35 (9.32)
PPI-R Total	305.52_a^{**} (31.43)	332.16_b^{**} (31.21)	315.40 (33.81)

Note. Means in the same row with different subscripts differ significantly at $^{*}p < .05$ or $^{**}p < .001$ (one-tailed).

Table 3.4 further summarizes mean total scores for males and females on the PPI-R by age group[4]. Consistent with the above PPI-R Total result, males in the 18 - 24 age range scored significantly higher on the PPI-R overall than their female counterparts, $t(134) = -4.75$, $p < .001$ (one-tailed), $d = .851$. While males in the 25 – 29 age range also scored higher on the PPI-R overall compared to age-matched females, this difference was not statistically significant, which may be due in part to the small group sizes within this age range, $t(9) = -.79$, $p = .226$ (one-tailed), $d = .559$.

Table 3.4. Mean PPI-R Totals by Age Group

Age Group	Females (*SD*) (Present Study)	Males (*SD*) (Present Study)	Females (*SD*) (Lilienfeld & Widows, 2005)	Males (*SD*) (Lilienfeld & Widows, 2005)
18 – 24	305.07_a^* (31.85) (*n* = 87)	331.88_b^* (31.18) (*n* = 49)	276.75 (31.14) (*n* = 394)	301.06 (31.26) (*n* = 235)
25 - 29	320.25 (9.36) (*n* = 4)	334.14 (33.84) (*n* = 7)	271.52 (32.22) (*n* = 33)	300.65 (32.83) (*n* = 34)
30-39	300.50 (38.21) (*n* = 4)	---	261.94 (31.91) (*n* = 62)	289.66 (34.23) (*n* = 56)

Note. Means in the same row with different subscripts differ significantly at $^*p < .001$ (one-tailed).

As indicated by the moderate intercorrelations between subscales on the PPI-R and on the LSRP in Table. 3.1, psychopathy is a heterogeneous construct. As such, further analyses were performed on the PPI-R and LSRP subscales to further examine possible differential associations between males and females on the different features of psychopathy. Means on the two LSRP subscales for the total sample as well as for males and females individually are displayed in Table 3.5. The first subscale, Primary Psychopathy, is comprised of 16 items with a maximum possible score of 48. Consistent with the LSRP Total score, males, on average, scored significantly higher than females on this subscale ($M = 29.95$, $SD = 8.29$ and $M = 26.69$, $SD = 5.71$, respectively), $t(84) = -2.58$, $p = .012$, $d = .458$. The overall mean on this subscale was

[4] For the purpose of comparison, results for all 17-year-old participants were combined with those of participants falling within the 18 - 24 age group, as the majority of these individuals were turning 18 within a month of participating in the study.

27.89 (*SD* = 6.92). The other subscale, Secondary Psychopathy, is comprised of 10 statements with a maximum possible score of 30. While males, on average, scored slightly higher than females on the subscale (*M* = 19.67, *SD* = 5.20 and *M* = 19.34, *SD* = 3.81), this difference was not significant, $t(88) = -.419$, $p = .676$, $d = .072$. The overall mean on this subscale was 19.46 (*SD* = 4.35).

Table 3.5. Mean LSRP Subscale Totals

LSRP Subscale	Females (*SD*) (*n* = 95)	Males (*SD*) (*n* = 55)	Overall (*SD*) (*n* = 150)
Primary Psychopathy	26.69_a (5.71)	29.95_b (8.29)	27.89 (6.92)
Secondary Psychopathy	19.34 (3.81)	19.67 (5.20)	19.46 (4.35)

Note. Means in the same row with different subscripts differ significantly at $p < .05$.

Table 3.6 displays the means of each of the eight PPI-R subscales by age group. In the 18 - 24 age group, males, on average, scored higher than females on seven of the subscales. Of these differences, the following five were statistically significant: Machiavellian Egocentricity (ME), $t(78) = -3.07$, $p = .003$, $d = .578$; Carefree Nonplanfulness (CN), $t(140) = -2.09$, $p = .039$, $d = .337$; Fearlessness (F), $t(140) = -2.63$, $p = .010$, d = .491; Stress Immunity (STI), $t(140) = -5.26$, $p < .001$, $d = .900$; and Coldheartedness (C), $t(80) = -3.66$, $p < .001$, $d = .605$ while the remaining two were not: Rebellious Nonconformity (RN), $t(85) = -1.58$, $p = .118$, $d = .333$ and Social Influence (SOI), $t(140) = -.748$, $p = .255$, $d = .162$. On the other hand, females, on average, scored slightly higher than males on the Blame Externalization (BE) subscale but this difference was not significant, $t(140) = .294$, $p = .769$, $d = -.059$.

In the 25 - 29 age group, males, on average, scored higher than females on five of the eight subscales. Of these differences, only one was statistically significant: Coldheartedness (C), $t(9) = -2.31$, $p = .047$, $d = 1.541$ while the rest were not: Rebellious Nonconformity (RN), $t(9) = -.273$, $p = .791$, $d = .191$; Carefree Nonplanfulness (CN), $t(9) = -1.12$, $p = .292$, $d = .792$; Social Influence (SOI), $t(9) = -.593$, $p = .567$, $d = .355$; and Stress Immunity (STI), $t(9) = -.301$, $p = .771$, $d = .205$. While females, on average, scored higher than males on the remaining three

Table 3.6. Mean PPI-R Subscale Totals by Age Group

	Age Group					
	18 – 24 years		25 – 29 years		30-39 years	
Subscale	Females (*SD*) (*n* = 87)	Males (*SD*) (*n* = 49)	Females (*SD*) (*n* = 4)	Males (*SD*) (*n* = 7)	Females (*SD*) (*n* = 4)	Males (*SD*) (*n* = 0)
ME	38.97_a^{**} (6.74)	43.92_b^{**} (10.06)	41.50 (7.14)	40.43 (7.02)	41.50 (6.66)	-
RN	31.74 (7.30)	34.57 (9.54)	33.75 (4.65)	35.43 (11.57)	28.00 (3.56)	-
BE	29.31 (7.93)	28.86 (7.41)	33.25 (4.99)	32.57 (10.25)	31.00 (4.24)	-
CN	32.51_a^{*} (6.88)	34.96_b^{*} (7.63)	30.75 (4.79)	39.57 (15.01)	29.50 (6.81)	-
SOI	45.16 (10.12)	46.84 (10.56)	39.00 (11.75)	42.71 (8.98)	47.00 (2.58)	-
F	32.83_a^{**} (9.08)	37.08_b^{**} (8.22)	37.00 (2.45)	36.14 (9.75)	26.25 (7.54)	-
STI	28.39_a^{***} (6.68)	34.84_b^{***} (7.62)	33.00 (4.69)	34.43 (8.68)	32.75 (11.59)	-
C	26.99_a^{***} (5.58)	31.14_b^{***} (7.94)	26.25_a^{*} (3.78)	33.86_b^{*} (5.87)	28.50 (5.72)	-

Note. ME = Machiavellian Egocentricity; RN = Rebellious Nonconformity; BE = Blame Externalization; CN = Carefree Nonplanfulness; SOI = Social Influence; F = Fearlessness; STI = Stress Immunity; C = Coldheartedness.
Means within the same row *and* age group with different subscripts differ significantly at $^{*}p < .05$, $^{**}p < .01$ or $^{***}p < .001$.

subscales, these differences were not significant: Machiavellian Egocentricity (ME), $t(9) = .242$, $p = .814$, $d = -.151$; Blame Externalization (BE), $t(7) = .122$, $p = .905$, $d = -.084$; and Fearlessness (F), $t(9) = .169$, $p = .869$, $d = -.121$.

The Lying Game. In addition to the lost computer data from the pilot testing, computer data from the first 14 participants run in the main study were similarly lost due to the same computer error. Thus, a total of 127 participants (78 females and 49 males) were included in the analyses of the game data.

Mean lying frequencies and lying severities are displayed in Table 3.7. These values represent the average values of lying frequency and severity across 10 trials. Thus, the possible range of values for lying frequency were 0 (i.e., never lied on a trial) to 10 (i.e., lied on all trials) and the possible range of values for lying severity (i.e., the difference between the actual and disclosed amounts) were 0 (i.e., no difference between actual and disclosed amounts on all trials) to 100 (i.e., a difference of $10, which is the maximum per trial, between actual and disclosed amounts on all trials). As can be seen in the table, on average, females lied slightly more than males in both the Exposure and Non-Exposure Conditions. However, these differences were not significant, $t(116) = .08$, $p = .94$, $d = -.067$ and $t(116) = 1.37$, $p = .18$, $d = -.220$, respectively. With respect to lying severity, males, on average, lied to a greater degree than females in both the Exposure and Non-Exposure Conditions, though these differences were also not significant, $t(116) = -1.14$, $p = .26$, $d = .176$ and $t(116) = -.39$, $p = .70$, $d = .109$, respectively.

Table 3.7. Mean Lying Frequencies and Severities

	Females (*SD*) ($n = 78$)	Males (*SD*) ($n = 49$)	Overall (*SD*) ($n = 127$)
Lying Frequency (Non-Exposure Condition)	3.97 (3.24)	3.27 (3.11)	3.70 (3.19)
Lying Frequency (Exposure Condition)	3.69 (3.27)	3.47 (3.32)	3.61 (3.27)
Lying Severity (Non-Exposure Condition)	14.87 (14.38)	16.57 (16.79)	15.53 (15.32)
Lying Severity (Exposure Condition)	14.58 (14.10)	17.31 (16.83)	15.63 (15.20)

Correlations

Correlations between the Mach-IV, LSRP, and PPI-R Total scores and the dependent measures are displayed in Table 3.8. Participant sex was dummy coded to examine sex differences (0 = female, 1 = male). As can be seen, there were significant positive correlations amongst the three measure totals (as previously reported) and amongst the dependent measures. Exposure Lying Frequency was positively and significantly related to the Mach-IV Total and the LSRP Total, $r = .236$, $p = .008$ and $r = .249$, $p = .005$, respectively. As well, Exposure Lying Severity was positively and significantly related to the Mach-IV Total and the LSRP Total, $r = .266$, $p = .003$ and $r = .250$, $p = .005$, respectively. As expected, Participant Sex was significantly and positively related to all three measures (i.e., males were more likely to score higher on the measures than females). However, Participant Sex was not significantly correlated with any of the dependent variables. Interestingly, Participant Age was negatively related to all of the dependent measures, the Mach-IV Total, and Participant Sex, and positively related to the LSRP and PPI-R Total scores, though none of these correlations reached significance.

Table 3.9 displays the correlations between the measure subscale totals and the dependent measures. Intercorrelations amongst subscales were previously reported in Table 3.1 and thus will not be discussed further here. The majority of the correlations between subscale totals and the dependent variables were non-significant, of small magnitude, and in some cases, negative. Notably, the Primary Psychopathy (PP) subscale of the LSRP was significantly correlated with all four dependent variables (with Non-Exposure Lying Frequency, $r = .180$, $p = .044$; with Exposure Lying Frequency, $r = .298$, $p = .001$; with Non-Exposure Lying Severity, $r = .192$, $p = .031$; and with Exposure Lying Severity, $r = .312$, $p = .000$). Also, the Machiavellian Egocentricity (ME) subscale was significantly and positively correlated with Exposure Lying Frequency ($r = .200$, $p = .024$) and Exposure Lying Severity ($r = .242$, $p = .006$). As expected, Participant Sex was significantly and positively related to most of the subscale totals (males were more likely to score higher on the subscales than females). A mix of negative and positive correlations were found between Participant Age and the subscale totals, though the majority of these were of small magnitude and non-significant, with the exception of the relationship between Participant Age and the Stress Immunity subscale, which was significantly and positively related, $r = .173$, $p = .033$.

Table 3.8. Correlations Between All Measure Totals and Dependent Variables

	Mach-IV Total	LSRP Total	PPI-R Total	Non-Exposure Lying Frequency	Exposure Lying Frequency	Non-Exposure Lying Severity	Exposure Lying Severity	Participant Sex
LSRP Total[a]	.645**[a]	-						
PPI-R Total[a]	.391**[a]	.523**[a]	-					
Non-Exposure Lying Frequency	.101[b]	.126[b]	-.061	-				
Exposure Lying Frequency	.236**[b]	.249**[b]	.060	.566**	-			
Non-Exposure Lying Severity	.088[b]	.126[b]	.007	.847**	.523**	-		
Exposure Lying Severity	.266**[b]	.250**[b]	.144	.461**	.892**	.467**	-	
Participant Sex	.323**[a]	.186*[a]	.382**[c]	-.109	-.033	.054	.088	-
Participant Age	-.014[a]	.016[a]	.092[c]	-.117	-.127	-.121	-.121	-.110

n = 127 except for [a]n = 150, [b]n = 126, [c]n = 151.
*p < .05. **p < .01.

Table 3.9. Correlations Between All Subscale Totals and Dependent Variables

Measure/Scale	PP	SP	ME	RN	BE	CN	SOI	F	STI	C
SP	.332**[a]	-								
ME	.784**[a]	.357**[a]	-							
RN	.201*[a]	.404**[a]	.220**	-						
BE	.266**[a]	.530**[a]	.316**	.295**	-					
CN	.254**[a]	.692**[a]	.294**	.553**	.351**	-				
SOI	.068[a]	-.200*[a]	.143	.219**	-.010	-.070	-			
F	.107[a]	.038[a]	.114	.490**	.102	.130	.416**	-		
STI	-.023[a]	-.191*[a]	-.057	.104	-.280**	.021	.233**	.301**	-	
C	.504**[a]	.145[a]	.407**	.078	.052	.304**	-.059	.056	.243**	-
Participant Sex	.227**[a]	.037[a]	.254**	.177*	-.014	.202*	.064	.230**	.377**	.321**
Participant Age	-.050[a]	.113[a]	-.034	.134	.061	.115	-.012	-.025	.173*	.067
Non-Exposure Lying Frequency[b]	.180*	-.019	.019	-.017	.059	-.046	-.079	-.142	-.157	.041
Exposure Lying Frequency[b]	.298**	.056	.200*	.037	.147	.025	-.032	-.079	-.133	.100
Non-Exposure Lying Severity[b]	.192*	-.040	.040	.026	-.034	.011	-.010	.120	-.019	.045
Exposure Lying Severity[b]	.312**	.034	.242**	.092	.132	.075	.002	-.021	-.066	.159

Note. PP = Primary Psychopathy; SP = Secondary Psychopathy; ME = Machiavellian Egocentricity; RN = Rebellious Nonconformity; BE = Blame Externalization; CN = Carefree Nonplanfulness; SOI = Social Influence; F = Fearlessness; STI = Stress Immunity; C = Coldheartedness.
n = 151 except for [a]n = 150 and [b]n = 127.
*p < .05. **p < .01.

Hierarchical Regressions

An *a priori* power analysis was conducted using $N = 104 + m$, (where m represented the number of independent variables) and it was determined that a minimum sample size of 108 would be required to detect a medium effect size (Green, 1991).

Lying Frequency. One of the main hypotheses proposed in the present research was that participants who were higher on psychopathic tendencies would lie more frequently than those who were lower. Another proposed hypothesis was that participants who were higher on psychopathic tendencies would lie as frequently to opponents they had met relative to those they had not. Additionally, no initial hypotheses were made with respect to sex differences on lying frequency in the game. Accordingly, two hierarchical regression analyses were conducted to determine whether the psychopathy/Machiavellianism measures and participant sex were related to lying frequency, one for each condition (i.e., Non-Exposure and Exposure).

In the first regression, lying frequency from the Non-Exposure Condition was entered as the dependent variable, while gender was entered as a predictor variable in step 1. Due to the moderate correlations (i.e., below .70) found amongst the three measures (reported in Table 3.1.), it was expected that entering all three measure variables into the regression equation simultaneously would provide a better estimate of lying frequency than entering these variables separately (Tabachnick & Fidell, 2007). Thus, the Mach-IV, LSRP, and PPI-R Totals were entered as predictor variables in step 2. Lastly, the interactions: sex x Mach-IV, sex x LSRP, and sex x PPI-R were entered as predictor variables in step 3. As shown in Table 3.10, participant sex did not account for a significant proportion of the variance in lying frequency. The greatest change in R^2 occurred in step 2 (i.e., $R^2_{change} = .035$), with participant sex and the totals from each of the three measures entered into the regression equation. However, this change was not significant, with the overall statistic for the model (step 2) being R^2 (3, 121) = .045, $p = .221$. Thus, these variables were not found to be significant predictors of lying frequency in the Non-Exposure Condition.

In the second regression, lying frequency from the Exposure Condition was entered as the dependent variable, with the same predictors and order of entry as in the first regression. Results from this analysis are displayed in Table 3.11. As in the first regression, participant sex did not account for a significant proportion of the variance in lying frequency. The greatest change in R^2 occurred in step 2 (i.e., $R^2_{change} = .090$), with sex and Mach-IV, LSRP, and PPI-R totals entered

into the equation. This time, however, the change was significant, with the overall statistic for the model (step 2) being R^2 (3, 121) = .092, p = .009. Thus, the three measures in combination were found to be significant predictors of lying frequency in the Exposure Condition, accounting for 9% of the variation in lying frequency. Interestingly, while the overall model (step 2) was significant, no single predictor on its own was found to make a significant contribution to the prediction of lying frequency (as indicated by the non-significant beta values).

Table 3.10. Summary of Hierarchical Regression Analysis for Variables Predicting Lying Frequency in the Non-Exposure Condition (N = 126)

Variables	R	ΔR^2	ΔF	B	SE B	β
Step 1	.098	.010	1.203			
Participant Sex				-.641	.584	-.098
Step 2	.212	.035	1.489			
Participant Sex				-.780	.658	-.119
Mach-IV Total				.025	.037	.078
LSRP Total				.054	.042	.159
PPI-R Total				-.010	.010	-.108
Step 3	.216	.002	.079			
Participant Sex				-2.876	6.897	-.440
Mach-IV Total				.021	.052	.066
LSRP Total				.040	.063	.117
PPI-R Total				-.010	.013	-.104
Sex x PPI-R				.002	.022	.083
Sex x Mach-IV				.010	.077	.087
Sex x LRSP				.021	.087	.171

Table 3.11. Summary of Hierarchical Regression Analysis for Variables Predicting Lying Frequency in the Exposure Condition ($N = 126$)

Variables	R	ΔR^2	ΔF	B	SE B	β
Step 1	.041	.002	.209			
Participant Sex				-.276	.604	-.041
Step 2	.304	.090	4.019*			
Participant Sex				-.839	.660	-.125
Mach-IV Total				.056	.038	.173
LSRP Total				.069	.043	.197
PPI-R Total				-.005	.010	-.055
Step 3	.312	.005	.230			
Participant Sex				-3.437	6.903	-.511
Mach-IV Total				.065	.052	.201
LSRP Total				.036	.063	.103
PPI-R Total				-.005	.013	-.052
Sex x PPI-R				.002	.022	.110
Sex x Mach-IV				-.017	.077	-.149
Sex x LRSP				.058	.087	.449

Note. $^{*}p < .01$

Post hoc analyses were conducted in order to clarify which combination of measures accounted for the most amount of variance in the final model for the Exposure Condition. Specifically, three hierarchical regressions were conducted pairing each of the three measures in turn. Results revealed that when the PPI-R Total was paired with each the Mach-IV and the LSRP separately, the overall model remained significant, R^2 (2, 122) = .073, p = .011 and R^2 (2, 122) = .075, p = .009, respectively. As well, the Mach-IV and LSRP were each found to be

significant individual predictors of lying frequency (i.e., beta values were significant), $t(122) = 2.931$, $p = .004$ and $t(122) = 2.994$, $p = .03$, respectively, while the PPI-R was not. However, when the Mach-IV and LSRP were paired together, their significant individual contributions disappeared, $t(122) = 1.530$, $p = .129$ and $t(122) = 1.535$, $p = .127$, respectively, though the overall model was still found to be significant, R^2 (2, 122) = .090, $p = .003$.

Given that the PPI-R is a fairly heterogeneous measure (as indicated by the modest subscale intercorrelations), an additional regression was conducted with all of the subscales entered in step 2 (step 1 included the variable of participant sex). In this case, the overall model was not significant, R^2 (8, 117) = .080, $p = .0272$, and none of the subscales were found to be significant individual predictors of lying frequency.

Further, given that the Machiavellian Egocentricity (ME) subscale correlated highest with lying frequency compared to the other subscales on the PPI-R, the same regression analyses that were conducted with the PPI-R Total were also conducted using the ME subscale in its place. Results using the ME subscale were comparable to those using the PPI-R Total, with the exception of the regression pairing it with the LSRP. In this case, the final model was significant, R^2 (2, 122) = .074, $p = .011$, however the LSRP was found to be only a marginally significant predictor of lying frequency on its own, $t(122) = 1.814$, $p = .072$.

In addition, given that the Primary Psychopathy (PP) subscale of the LSRP correlated significantly with lying frequency in both the Non-Exposure and Exposure Conditions, two additional regression analyses, one for each condition, were conducted using the PP subscale in place of the LSRP Total and the ME subscale in place of the PPI-R Total. Again, Participant Sex was entered as a predictor variable in step 1 while the Mach-IV, PP subscale, and ME subscale were entered as predictor variables in step 2. The overall model for the Exposure Condition was significant, R^2 (3, 121) = .116, $p = .002$. As well, the PP subscale was found to be a significant individual predictor of lying frequency, $t(121) = 2.177$, $p = .031$. Interestingly, the overall model for the Non-Exposure Condition was also significant, R^2 (3, 121) = .087, $p = .019$. Additionally, the PP subscale and the ME subscale were found to be significant individual predictors of lying frequency in this condition, $t(121) = 2.740$, $p = .007$ and $t(121) = -2.052$, $p = .042$, respectively.

Overall, the results partially support the hypotheses that individuals who scored higher on the psychopathy/Machiavellian measures would lie more than those who scored lower and would

do so whether they had met their opponent or not in that these measures predicted lying frequency in the Exposure but not in the Non-Exposure Condition.

Lying Severity. Two hierarchical regressions were run, one for the Non-Exposure Condition and one for the Exposure Condition, in order to assess the hypothesis that participants scoring higher on psychopathic tendencies would lie to a greater degree or severity than those scoring lower. While the participant sex variable was also examined, no initial hypotheses were generated with respect to its relation to lying severity.

In the first regression, lying severity from the Non-Exposure Condition was entered as the dependent variable, while Participant Sex was entered as a predictor variable in step 1. Due to the moderate correlations (i.e., below .70) found amongst the three measures (reported in Table 3.1.), it was expected that entering all three measure variables into the regression equation simultaneously would provide a better estimate of lying severity than entering these variables separately (Tabachnick & Fidell, 2007). Thus, the Mach-IV, LSRP, and PPI-R Totals were entered as predictor variables in step 2. Lastly the interactions: sex x Mach-IV, sex x LSRP, and sex x PPI-R were entered as predictor variables in step 3. As shown in Table 3.12, Participant Sex did not account for a significant proportion of the variance in lying severity. The greatest change in R^2 occurred in step 2 (i.e., $R^2_{change} = .018$), with gender and the totals from each of the three measures entered into the regression equation. However, contrary to expectation, this change was not significant, with the overall statistic for the model (step 2) being R^2 (3, 121) = .022, $p = .537$. Thus, these variables were not found to be significant predictors of lying severity in the Non-Exposure Condition.

In the second regression, lying severity from the Exposure Condition was entered as the dependent variable, with the same predictors and order of entry as in the previous regression. Results from this analysis are displayed in Table 3.13. As in the previous regression, Participant Sex did not account for a significant proportion of the variation in lying severity. The greatest change in R^2 occurred in step 2 (i.e., $R^2_{change} = .076$), with Participant Sex and the totals from the Mach-IV, LSRP, and PPI-R entered into the regression equation. This time, however, the change was significant, with the overall statistic for the model (step 2) being R^2 (3, 121) = .082, $p = .021$. Thus, the three measures in combination were found to be significant predictors of lying severity in the Exposure Condition, accounting for 7.6% of the variation in lying severity. Interestingly, while the overall model (step 2) was significant, no single predictor on its own was found to

Table 3.12. Summary of Hierarchical Regression Analysis for Variables Predicting Lying Severity in the Non-Exposure Condition ($N = 126$)

Variables	R	ΔR^2	ΔF	B	SE B	β
Step 1	.065	.004	.527			
Participant Sex				2.043	2.814	.065
Step 2	.148	.018	.728			
Participant Sex				1.986	3.197	.063
Mach-IV Total				-.004	.182	-.003
LSRP Total				.253	.207	.155
PPI-R Total				-.038	.050	-.084
Step 3	.197	.017	.690			
Participant Sex				-36.830	33.260	-1.173
Mach-IV Total				-.129	.252	-.085
LSRP Total				.170	.301	.104
PPI-R Total				-.046	.065	-.101
Sex x PPI-R				.059	.107	.633
Sex x Mach-IV				.297	.370	.560
Sex x LRSP				.068	.420	.114

make a significant contribution to the prediction of lying severity (as seen by the non-significant beta values).

Post hoc analyses were conducted in order to clarify which combination of measures accounted for the most amount of variance in the final model for the Exposure Condition. Specifically, three hierarchical regressions were conducted pairing each of the three measures in turn. Results revealed that when the PPI-R Total was paired with each the Mach-IV and the

Table 3.13.Summary of Hierarchical Regression Analysis for Variables Predicting Lying Severity in the Exposure Condition ($N = 126$)

Variables	R	ΔR^2	ΔF	B	SE B	β
Step 1	.078	.006	.766			
Participant Sex				2.444	2.791	.078
Step 2	.287	.076	3.353*			
Participant Sex				-.697	3.074	-.022
Mach-IV Total				.281	.175	.187
LSRP Total				.209	.199	.130
PPI-R Total				.007	.048	.014
Step 3	.295	.004	.186			
Participant Sex				7.783	32.185	.250
Mach-IV Total				.392	.244	.261
LSRP Total				.087	.292	.054
PPI-R Total				.013	.063	.029
Sex x PPI-R				-.023	.104	-.251
Sex x Mach-IV				-.245	.358	-.465
Sex x LRSP				.257	.407	.432

Note. $^{*}p < .05$

LSRP separately, the overall model remained significant, R^2 (2, 122) = .074, p = .013 and R^2 (2, 122) = .063, p = .028, respectively. As well, the Mach-IV and LSRP were each found to be significant individual predictors of lying severity (i.e., beta values were significant), $t(122)$ = 2.696, p = .008 and $t(122)$ = 2.393, p = .018, respectively, while the PPI-R was not. However, when the Mach-IV and LSRP were paired together, their significant individual contributions

disappeared, t(122) = 1.689, $p = .110$ and $t(122) = 1.217$, $p = .226$, respectively, though the overall model was still found to be significant, R^2 (2, 122) = .082, $p = .008$.

Given that the PPI-R is a fairly heterogeneous measure (as indicated by the modest subscale intercorrelations), an additional regression was conducted with all of the subscales entered in step 2 (step 1 included the Participant Sex variable). In this case, the overall model was not significant, R^2 (8, 117) = .084, $p = .296$, and none of the subscales were found to be significant individual predictors of lying severity.

Further, given that the Machiavellian Egocentricity (ME) subscale correlated highest with lying severity in the Exposure Condition compared to the other subscales, the same regression analyses that were conducted with the PPI-R Total were also conducted using the ME subscale in its place. Results using the ME subscale were comparable to those using the PPI-R Total, with the exception of the regression pairing it with the Mach-IV. In this case, the final model was significant, R^2 (2, 122) = .083, $p = .007$, however the Mach-IV was found to be only a marginally significant predictor of lying frequency on its own, $t(122) = 1.858$, $p = .066$. As well, when ME was paired with the LSRP, the final model was significant, R^2 (2, 122) = .068, $p = .019$, though LSRP was no longer a significant individual predictor of lying severity, $t(122) = 1.210$, $p = .229$.

In addition, given that the Primary Psychopathy (PP) subscale of the LSRP correlated significantly with lying severity in both the Non-Exposure and Exposure Conditions, two additional regression analyses, one for each condition, were conducted using the PP subscale in place of the LSRP Total and the ME subscale in place of the PPI-R Total. Again, Participant Sex was entered as a predictor variable in step 1 while the Mach-IV, PP subscale, and ME subscale were entered as predictor variables in step 2. The overall model for the Exposure Condition was significant, R^2 (3, 121) = .106, $p = .005$. As well, the PP subscale was found to be a marginally significant individual predictor of lying severity in this condition, $t(121) = 1.762$, $p = .081$. Interestingly, the overall model for the Non-Exposure Condition was also significant, R^2 (3, 121) = .069, $p = .043$. Also, the PP subscale was found to be a significant individual predictor of lying severity in this condition, $t(121) = 2.782$, $p = .006$, while the ME subscale was found to be a marginally significant individual predictor, $t(121) = -1.942$, $p = .054$.

Overall, the results partially support the hypotheses that individuals who scored higher on the psychopathy/Machiavellian measures would lie to a greater degree than those who scored

lower and would do so whether they had met their opponent or not in that these measures predicted lying severity in the Exposure but not in the Non-Exposure Condition.

Mixed ANOVAs

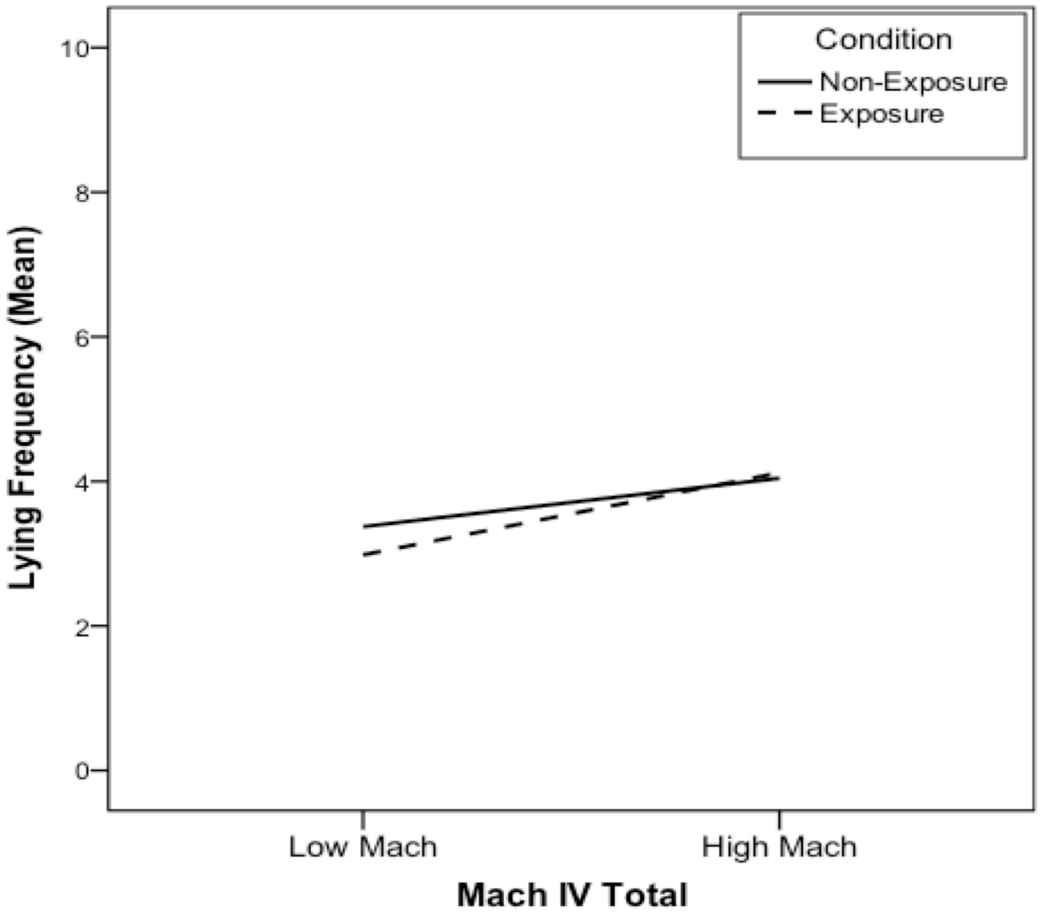
In order to extend the results of the correlational analyses and the hierarchical regressions, three 2 x 2 mixed design ANOVAs were run comparing level of psychopathy/Machiavellianism (i.e., high or low on Mach-IV, LSRP, and PPI-R), as the between-subjects factor, by Condition (i.e., Non-Exposure and Exposure), as the within-subjects factor, with lying frequency as the dependent variable. Another three 2 x 2 mixed design ANOVAs were run comparing level of psychopathy/Machiavellianism (i.e., high or low on Mach-IV, LSRP, and PPI-R), as the between-subjects factor, by Condition (i.e., Non-Exposure and Exposure), as the within-subjects factor, with lying severity as the dependent variable. The psychopathy and Machiavellianism variables were dichotomized using a median split.

Lying Frequency. For lying frequency, based on the results from the correlational analyses and the hierarchical regressions, it was expected that individuals scoring high on the Mach-IV, LSRP, and PPI-R would lie more frequently than those scoring low on these measures in the Exposure Condition but not in the Non-Exposure Condition. Mixed design ANOVAS were run for each of the three measures in turn.

For the Mach-IV, there was no significant main effect of Condition, indicating that, overall, participants lied as frequently in the Non-Exposure Condition as in the Exposure Condition, $F(1, 124) = .351$, $p = .555$, partial $\eta^2 = .003$. There was a marginally significant main effect of Machiavellianism, indicating that high Machs averaged higher on lying frequency than low Machs, $F(1, 124) = 3.164$, $p = .078$, partial $\eta^2 = .025$. The interaction effect was not significant, $F(1, 124) = .762$, $p = .384$, partial $\eta^2 = .006$, indicating that the effect of Condition on lying frequency was the same for low Machs as it was for high Machs. These results are displayed in Figure 3.1.

For the LSRP, there was no significant main effect of Condition, indicating that, overall, participants lied as frequently in the Non-Exposure Condition as in the Exposure Condition, $F(1, 124) = .411$, $p = .522$, partial $\eta^2 = .003$. There was a marginally significant main effect of psychopathy, indicating that high scorers on the LSRP averaged higher on lying frequency than low scorers, $F(1, 124) = 3.428$, $p = .066$, partial $\eta^2 = .027$. The interaction effect was significant,

Figure 3.1. Lying Frequency by Machiavellianism (Mach-IV) and Degree of Exposure to Opponent



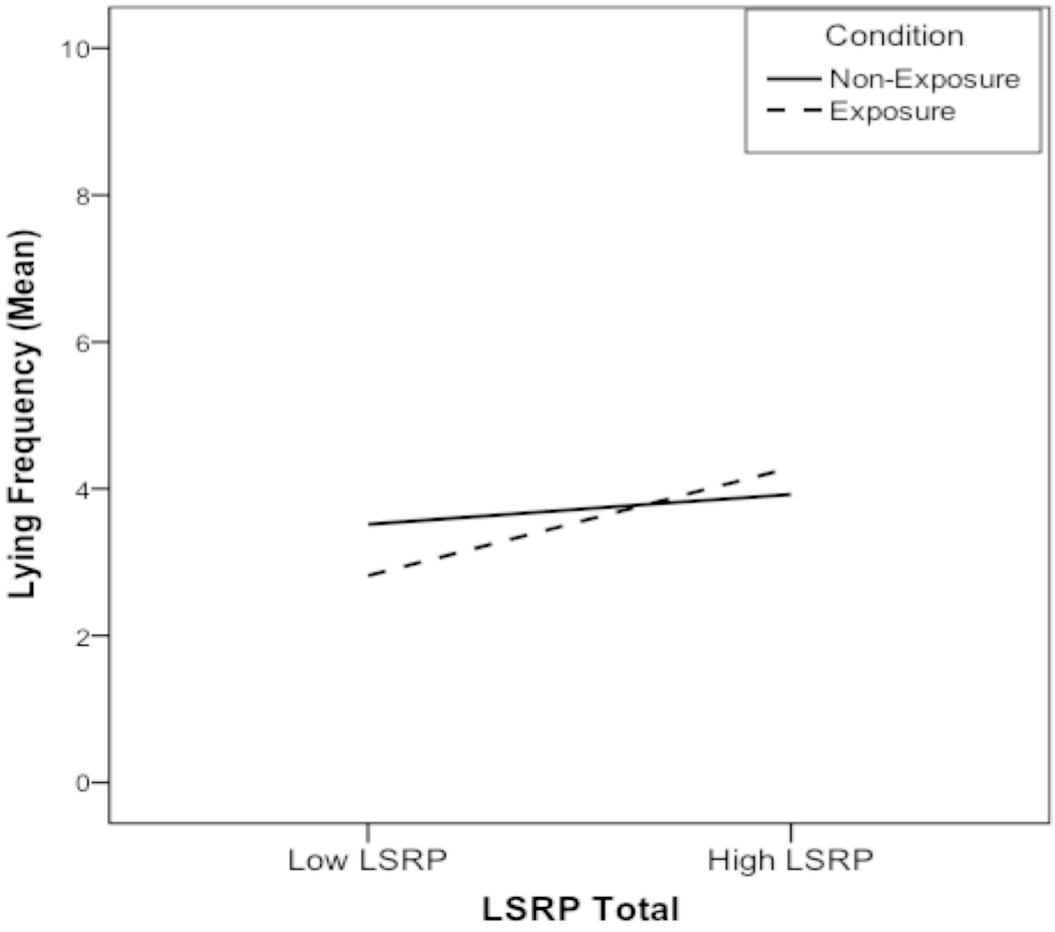
$F(1, 124) = 4.113$, $p = .045$, partial $\eta^2 = .032$, indicating that the effect of Condition on lying frequency was different for low scorers on the LSRP than it was for high scorers. The nature of this effect is displayed in Figure 3.2. As can be seen, while, on average, high scorers on the LSRP lied more frequently than low scorers in both conditions, this difference was rather small in the Non-Exposure Condition. Interestingly, on average, low scorers on the LSRP lied less in the Exposure Condition than in the Non-Exposure Condition while high scorers, on average, lied more in the Exposure Condition than in the Non-Exposure Condition.

Simple effect analyses showed that differences in lying frequency due to Conditions were marginally significant for participants scoring low on the LSRP, $t(59) = 1.769$, $p = .082$, $d = .228$, indicating that these participants trended towards lying marginally less in the Exposure Condition compared to the Non-Exposure Condition. On the other hand, there was no significant

difference due to Conditions for participants scoring high on the LSRP, $t(65) = -1.047$, $p = .299$, $d = -.131$, indicating that these participants did not lie significantly more in the Exposure Condition relative to the Non-Exposure Condition.

Analyses of the simple effect of level of psychopathy on lying frequency was significant for the Exposure Condition but not for the Non-Exposure Condition, $t(124) = -2.571$, $p = .011$, $d = -.458$ and $t(124) = -.715$, $p = .476$, $d = -.125$, respectively. These results indicate that low scorers on the LSRP did not statistically differ from high scorers in the Non-Exposure Condition but did statistically differ in the Exposure Condition, with high scorers lying more than low scorers.

Figure 3.2. Lying Frequency by Psychopathy (LSRP) and Degree of Exposure to Opponent



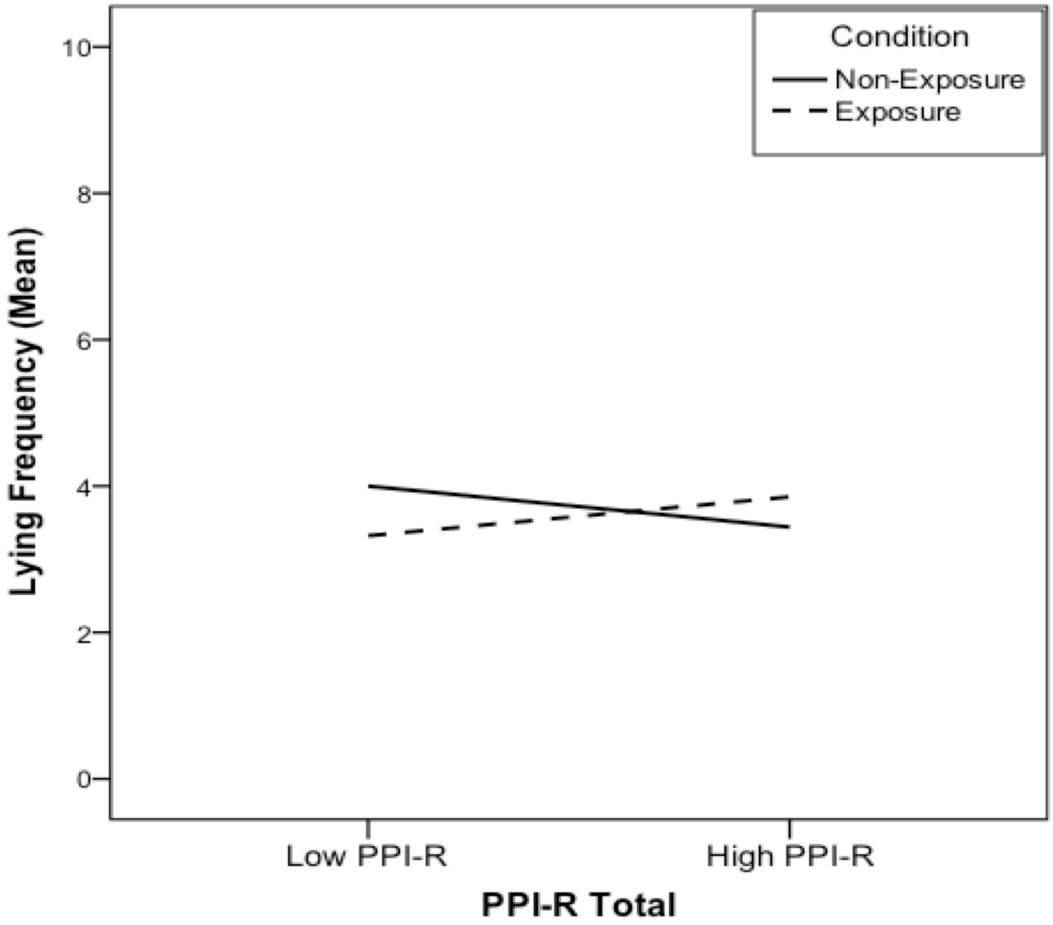
For the PPI-R, there was no significant main effect of Condition, indicating that, overall, participants lied as frequently in the Non-Exposure Condition as in the Exposure Condition, $F(1, 125) = .253$, $p = .616$, partial $\eta^2 = .002$. There was also no significant main effect of psychopathy, indicating that, on average, high scorers on the PPI-R lied as frequently as low scorers, $F(1, 125) = .001$, $p = .978$, partial $\eta^2 = .000$. The interaction effect was significant, $F(1, 125) = 4.235$, $p = .042$, partial $\eta^2 = .033$, indicating that the effect of condition on lying frequency was different for low scorers on the PPI-R than it was for high scorers. The nature of this effect is displayed in Figure 3.3. As can be seen, contrary to expectations, low scorers on the PPI-R, lied more frequently, on average, than high scorers in the Non-Exposure Condition while high scorers, on average, lied more frequently than low scorers in the Exposure Condition. As with the LSRP, on average, low scorers on the PPI-R, lied less in the Exposure Condition than in the Non-Exposure Condition while high scorers lied more, on average, in the Exposure Condition compared to the Non-Exposure Condition.

Simple effect analyses revealed that differences in lying frequency due to Conditions did not occur for low scorers or high scorers on the PPI-R, $t(58) = 1.597$, $p = .116$, $d = .194$ and $t(67) = -1.255$, $p = .214$, $d = -.152$, respectively. These results indicate that lying frequency for low scorers on the PPI-R did not statistically differ in the Non-Exposure and Exposure Conditions; the same was also found for high scorers.

Analyses of the simple effect of level of psychopathy on lying frequency was not significant for the Non-Exposure Condition nor for the Exposure Condition, $t(125) = .984$, $p = .327$, $d = .175$ and $t(125) = -.911$, $p = .364$, $d = -.162$, respectively. These results indicate that low scorers on the PPI-R did not statistically differ from high scorers in the Non-Exposure Condition nor did they statistically differ in the Exposure Condition.

Additionally, given that the Machiavellian Egocentricity (ME) subscale of the PPI-R correlated significantly with Lying Frequency in the Exposure Condition and the Primary Psychopathy (PP) subscale of the LSRP correlated significantly with Lying Frequency in both the Exposure and Non-Exposure Conditions, two 2 X 2 mixed design ANOVAs, one involving the ME subscale and the other involving the PP subscale, were also conducted. Specifically, level of psychopathy/Machiavellianism was the between subjects factor (i.e., high or low on the ME and PP subscales, dichotomized using a median split) and Condition (i.e., Non-Exposure and

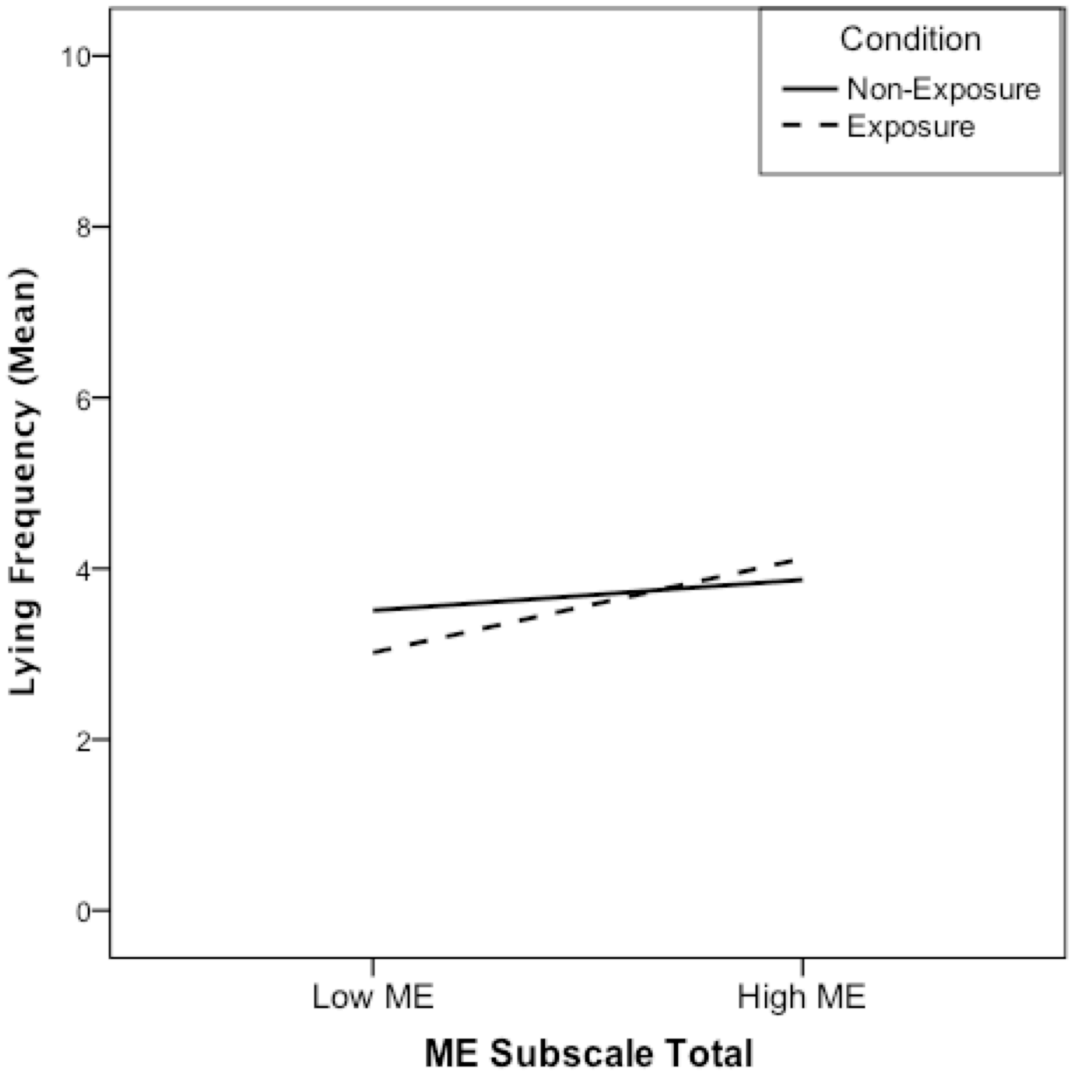
Figure 3.3. Lying Frequency by Psychopathy (PPI-R) and Degree of Exposure to Opponent



Exposure) was the within-subjects factor, with lying frequency as the dependent variable. Mixed design ANOVAs comparing level of psychopathy (high vs. low) by Condition were conducted on the remaining subscales and these results can be found in Appendix R.

For the ME subscale, there was no significant main effect of Condition, indicating that, overall, participants lied as frequently in the Non-Exposure Condition as in the Exposure Condition, $F(1, 125) = .204$, $p = .652$, partial $\eta^2 = .002$. There was also a non-significant main effect of Machiavellianism, indicating that, on average, high scorers on the ME subscale lied as frequently as low scorers, $F(1, 125) = 2.074$, $p = .152$, partial $\eta^2 = .016$. The interaction effect was not significant, $F(1, 125) = 1.926$, $p = .168$, partial $\eta^2 = .015$, indicating that the effect of Condition on lying frequency was the same for low scorers and higher scorers on the ME subscale. These results are displayed in Figure 3.4.

Figure 3.4. Lying Frequency by Psychopathy (ME Subscale) and Degree of Exposure to Opponent



For the PP subscale, there was no significant main effect of Condition, indicating that, overall, participants lied as frequently in the Non-Exposure Condition as in the Exposure Condition, $F(1, 124) = .227$, $p = .635$, partial $\eta^2 = .002$. There was a marginally significant main effect of psychopathy, indicating that high scorers on the PP subscale trended towards higher rates of lying than low scorers, $F(1, 124) = 3.740$, $p = .055$, partial $\eta^2 = .029$. The interaction effect was significant, $F(1, 124) = 4.989$, $p = .027$, partial $\eta^2 = .039$, indicating that the effect of Condition on lying frequency was different for low scorers on the PP subscale than it was for high scorers. The nature of this effect is displayed in Figure 3.5. As can be seen, while, on

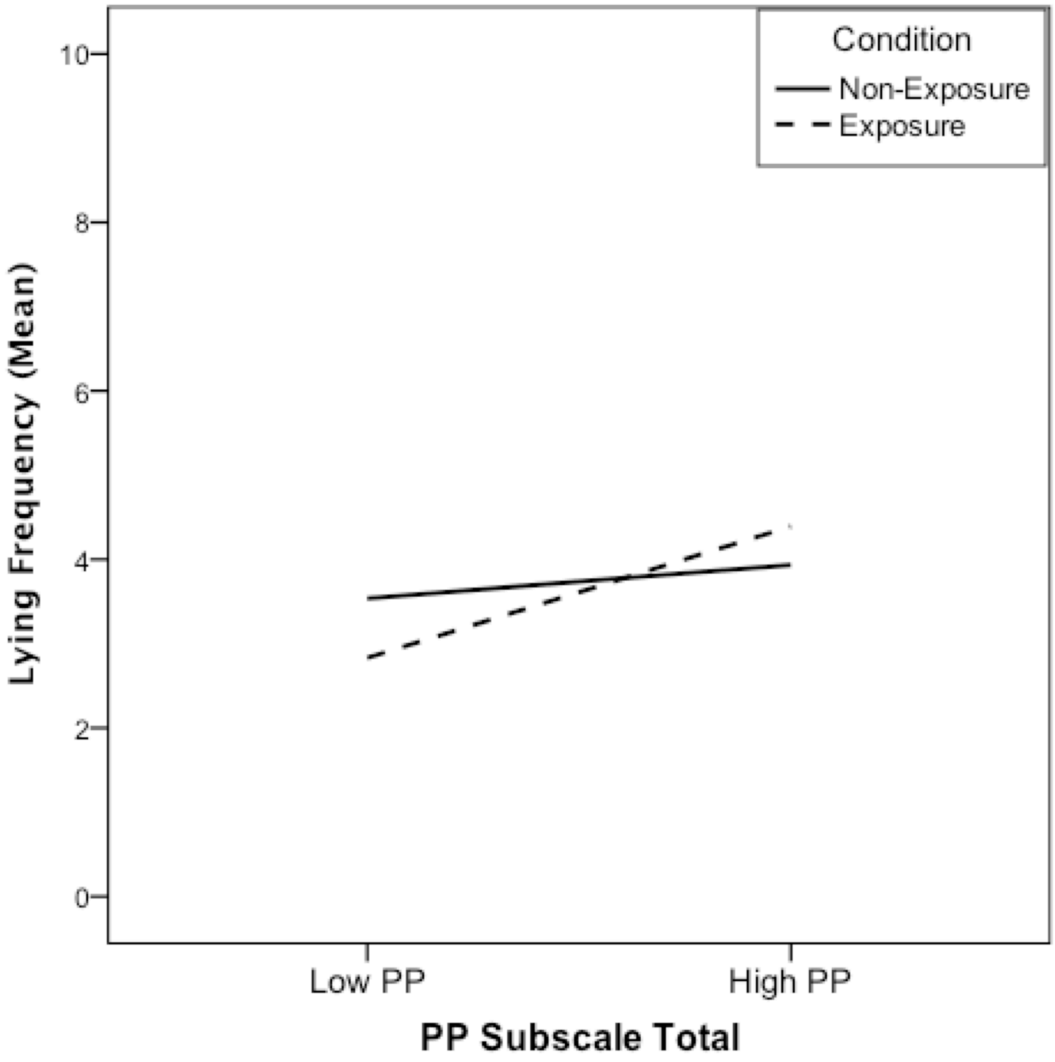
average, high scorers on the PP subscale lied more frequently than low scorers in both conditions, this difference was rather small in the Non-Exposure Condition. Interestingly, on average, low scorers on the PP subscale lied less in the Exposure Condition than in the Non-Exposure Condition while high scorers, on average, lied more in the Exposure Condition than in the Non-Exposure Condition.

Simple effect analyses showed that differences in lying frequency due to Conditions were marginally significant for participants scoring low on the PP subscale, $t(64) = 1.819$, $p = .074$, $d = .226$, indicating that these participants trended towards lying marginally less in the Exposure Condition compared to the Non-Exposure Condition. On the other hand, there was no significant difference due to Conditions for participants scoring high on the PP subscale, $t(60) = -1.331$, $p = .188$, $d = -.171$, indicating that these participants did not lie significantly more in the Exposure Condition relative to the Non-Exposure Condition.

Analyses of the simple effect of level of psychopathy on lying frequency was significant for the Exposure Condition but not for the Non-Exposure Condition, $t(124) = -2.742$, $p = .007$, $d = -.488$ and $t(124) = -.695$, $p = .488$, $d = -.122$, respectively. These results indicate that low scorers on the PP subscale did not statistically differ from high scorers in the Non-Exposure Condition but did statistically differ in the Exposure Condition, with high scorers lying more than low scorers.

Overall, the results from the mixed ANOVAs partially support the hypothesis that individuals who scored higher on the psychopathy/Machiavellianism measures would lie more frequently than those who scored lower, as individuals who scored high on some measures (i.e., Mach-IV Total, LSRP Total and PP subscale) lied more frequently overall than those who scored low on the same measures. Interestingly, simple effect analyses revealed that individuals who scored high on the LSRP Total and PP subscale lied more than individuals who scored low in the Exposure but not in the Non-Exposure Condition.

Figure 3.5. Lying Frequency by Psychopathy (PP Subscale) and Degree of Exposure to Opponent



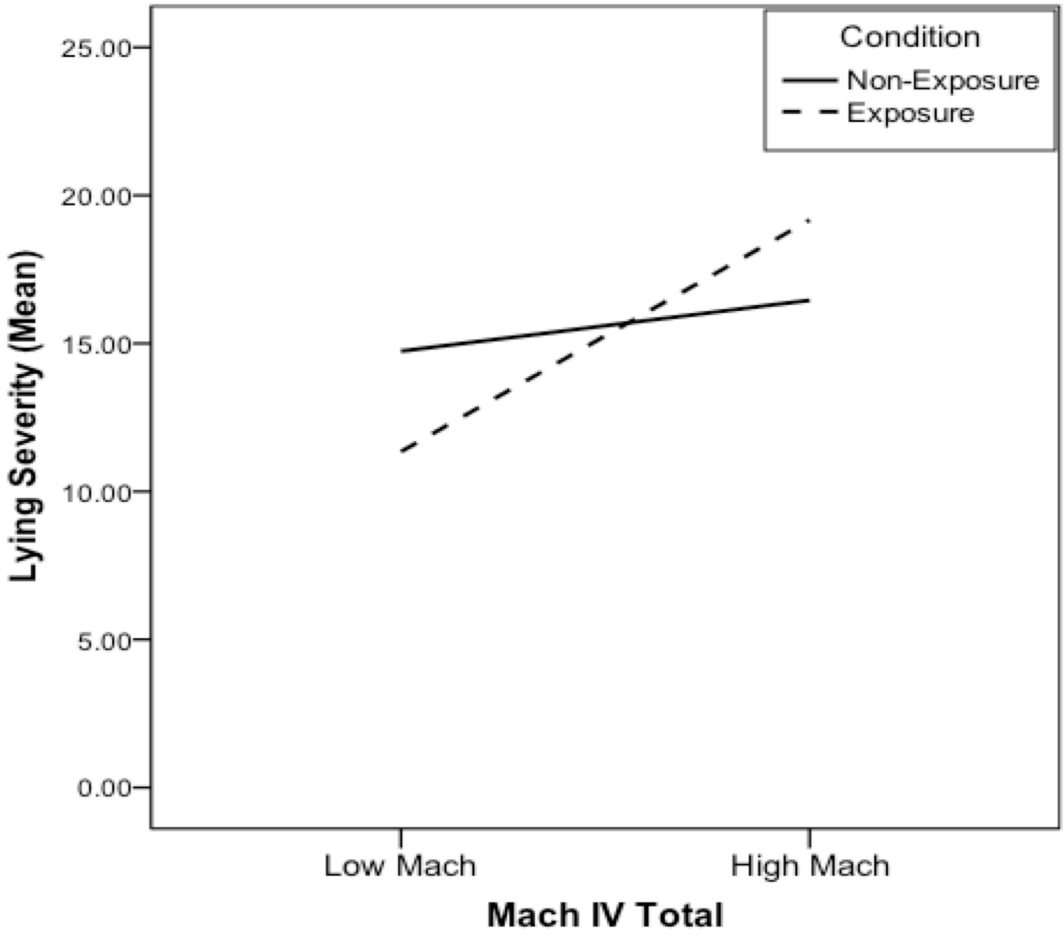
Lying Severity. For lying severity, based on the results from the correlational analyses and the hierarchical regressions, it was expected that individuals scoring high on the Mach-IV, LSRP, and PPI-R would lie to a greater degree or severity than those scoring low on these measures in the Exposure Condition but not the Non-Exposure Condition. Mixed design ANOVAS were run for each of the three measures in turn.

For the Mach-IV, there was no significant main effect of Condition, indicating that, overall, participants lied to the same degree in the Non-Exposure Condition as in the Exposure Condition, $F(1, 124) = .061$, $p = .805$, partial $\eta^2 = .000$. There was a significant main effect of Machiavellianism, indicating that high Machs averaged higher on lying severity than low Machs, $F(1, 124) = 4.259$, $p = .041$, partial $\eta^2 = .033$. The interaction effect was also significant, $F(1, 124) = 4.969$, $p = .028$, partial $\eta^2 = .039$, indicating that the effect of condition on lying severity was different for low Machs than it was for high Machs. The nature of this effect is displayed in Figure 3.6. As can be seen, on average, high Machs lied to a greater degree than low Machs in both the Non-Exposure and Exposure Conditions. Reflecting the pattern seen in the lying frequency results, on average, low Machs lied to a lesser extent in the Exposure Condition than the Non-Exposure Condition while high Machs lied to a greater extent in the Exposure Condition than the Non-Exposure Condition.

Simple effect analyses showed that differences in lying severity due to Conditions did not occur for low or high Machs, $t(58) = 1.545$, $p = .128$, $d = .203$ and $t(66) = -1.601$, $p = .114$, $d = -.196$, respectively. These results indicate that lying severity for low Machs did not statistically differ in the Non-Exposure and Exposure Conditions; the same was also found for high Machs.

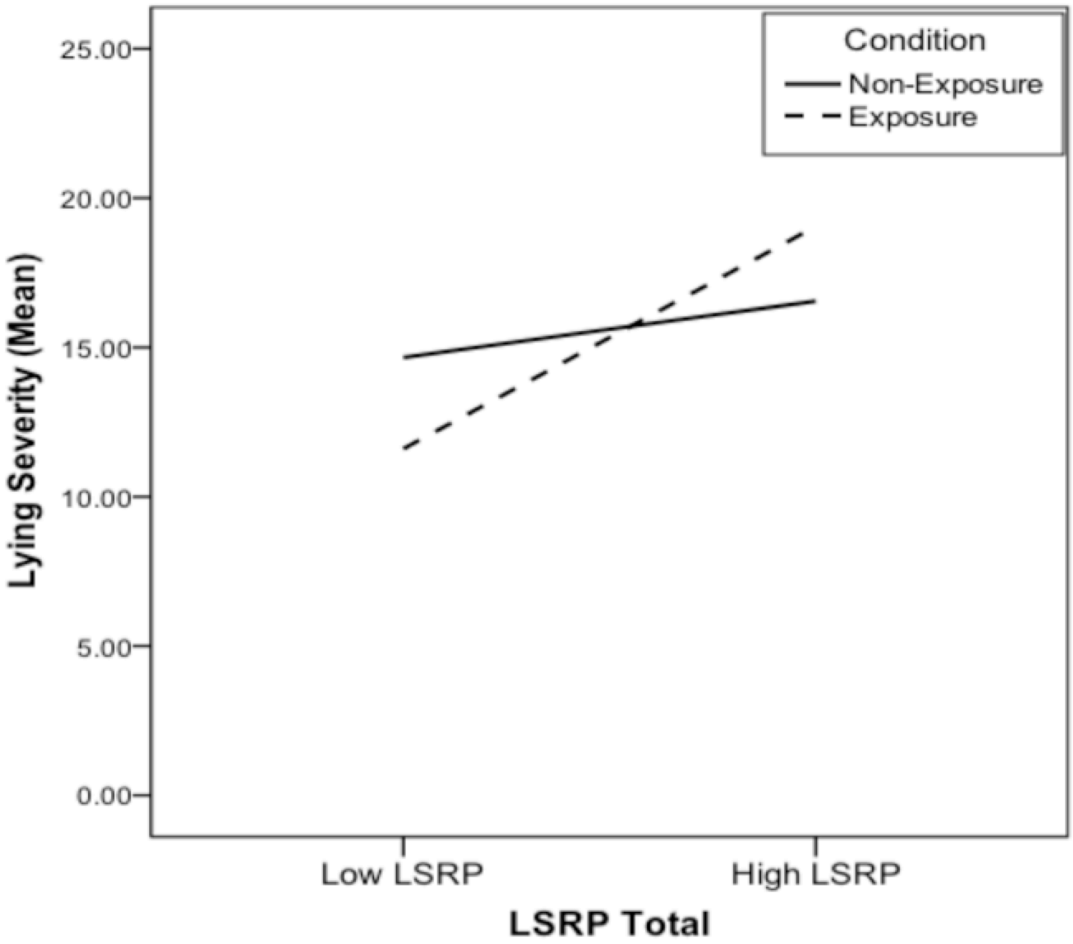
Analyses of the simple effect of level of Machiavellianism on lying severity was significant for the Exposure Condition but not for the Non-Exposure Condition, $t(124) = -2.972$, $p = .004$, $d = -.536$ and $t(124) = -.628$, $p = .531$, $d = -.112$. These results indicate that low Machs did not statistically differ from high Machs in the Non-Exposure Condition but did statistically differ from them in the Exposure Condition, with high Machs lying to a greater degree than low Machs.

Figure 3.6. Lying Severity by Machiavellianism (Mach-IV) and Degree of Exposure to Opponent



For the LSRP, there was no significant main effect of Condition, indicating that, overall, participants lied to the same degree in the Non-Exposure Condition as in the Exposure Condition, $F(1, 124) = .041$, $p = .841$, partial $\eta^2 = .000$. There was a significant main effect of psychopathy, indicating that high scorers on the LSRP averaged higher on lying severity than low scorers, $F(1, 124) = 4.070$, $p = .046$, partial $\eta^2 = .032$. The interaction effect was also significant, $F(1, 124) = 4.104$, $p = .045$, partial $\eta^2 = .032$, indicating that the effect of condition on lying severity was different for low scorers on the LSRP than it was for high scorers. The nature of this effect is displayed in Figure 3.7. As can be seen, on average, high scorers on the LSRP lied to a greater extent than low scorers in both conditions. Again, reflecting the pattern observed in lying frequency, on average, low scorers on the LSRP lied to a lesser degree in the Exposure Condition relative to the Non-Exposure Condition while high scorers, on average, lied to a greater degree in the Exposure Condition compared to the Non-Exposure Condition.

Figure 3.7. Lying Severity by Psychopathy (LSRP) and Degree of Exposure to Opponent



Simple effect analyses showed that differences in lying severity due to Conditions did not occur for low scorers on the LSRP or high scorers, $t(59) = 1.561$, $p = .124$, $d = .202$ and $t(65) = -1.305$, $p = .196$, $d = -.161$, respectively. These results indicate that lying severity for low scorers on the LSRP did not statistically differ in the Non-Exposure and Exposure Conditions; the same was also found for high scorers.

Analyses of the simple effect of level of psychopathy on lying severity was significant for the Exposure Condition but not for the Non-Exposure Condition, $t(124) = -2.821$, $p = .006$, $d = -.505$ and $t(124) = -.688$, $p = .493$, $d = -.123$, respectively. These results indicate that low scorers on the LSRP did not statistically differ from high scorers in the Non-Exposure Condition but did statistically differ from them in the Exposure Condition, with high scorers lying to a greater degree than low scorers.

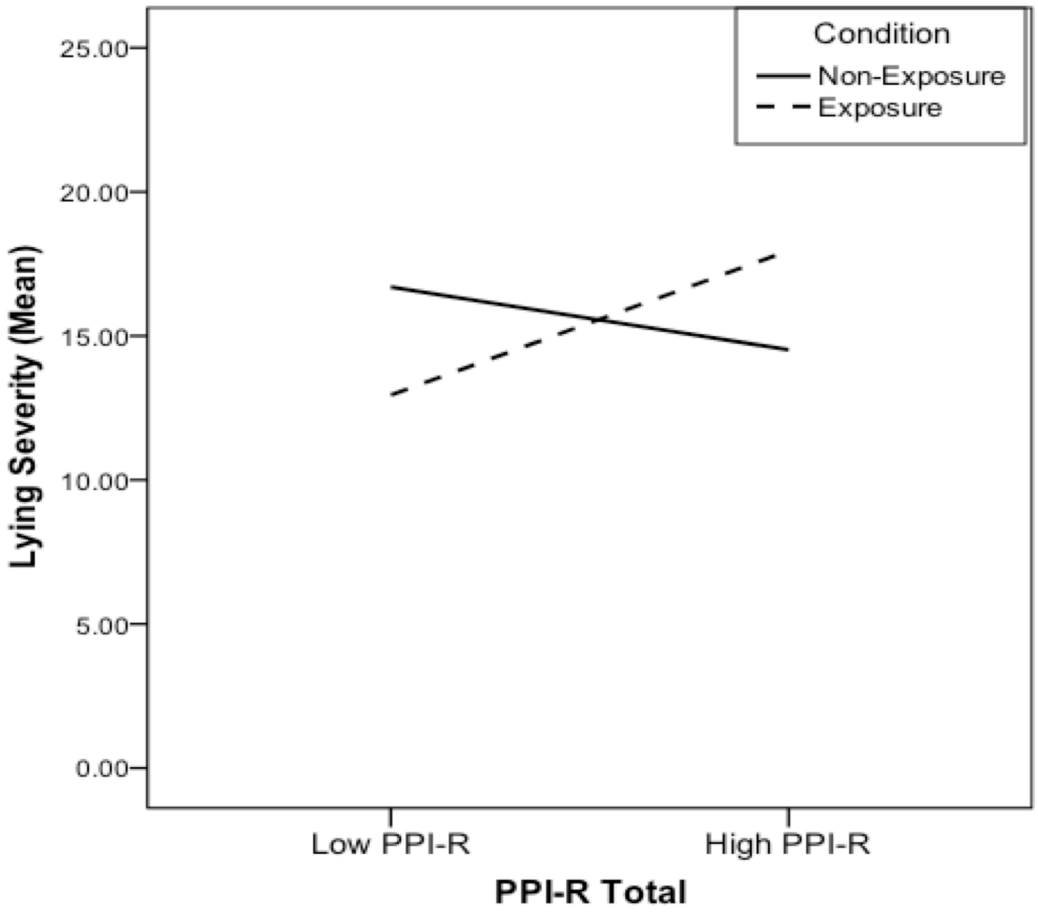
For the PPI-R, there was no significant main effect of Condition, indicating that, overall, participants lied to the same degree in the Non-Exposure Condition as in the Exposure Condition, $F(1, 125) = .013$, $p = .911$, partial $\eta^2 = .000$. There was also no significant main effect of psychopathy, indicating that, on average, high scorers on the PPI-R lied to the same degree as low scorers, $F(1, 125) = .369$, $p = .545$, partial $\eta^2 = .003$. The interaction effect was significant, $F(1, 25) = 6.865$, $p = .010$, partial $\eta^2 = .052$, indicating that the effect of Condition on lying severity was different for low scorers on the PPI-R than it was for high scorers. The nature of this effect is displayed in Figure 3.8. As can be seen, contrary to expectations but consistent with what was observed with the lying frequency results for the PPI-R, on average, low scorers on the PPI-R lied to a greater degree than high scorers in the Non-Exposure Condition while high scorers, on average, lied to a greater degree than low scorers in the Exposure Condition. Again, mirroring the pattern observed in lying frequency, on average, low scorers on the PPI-R lied to a lesser degree in the Exposure Condition relative to the Non-Exposure Condition while high scorers, on average, lied to a greater degree in the Exposure Condition compared to the Non-Exposure Condition.

Simple effect analyses showed that differences in lying severity due to Conditions were marginally significant for low scorers on the PPI-R, $t(58) = 1.737$, $p = .088$, $d = .227$, and for high scorers, $t(67) = -1.977$, $p = .052$, $d = -.240$. These results indicate that lying severity for low scorers trended towards being marginally higher in the Non-Exposure Condition than in the Exposure Condition while for high scorers, lying severity trended towards being marginally higher in the Exposure Condition than in the Non-Exposure Condition.

Analyses of the simple effect of level of psychopathy on lying severity was marginally significant for the Exposure Condition but not for the Non-Exposure Condition, $t(125) = -1.869$, $p = .064$, $d = -.337$ and $t(125) = .797$, $p = .427$, $d = .142$. These results indicate that low scorers on the LSRP did not differ from high scorers on lying severity in the Non-Exposure Condition but trended towards being marginally lower than that of high scorers in the Exposure Condition.

Additionally, given that the Machiavellian Egocentricity (ME) subscale of the PPI-R correlated significantly with Lying Severity in the Exposure Condition and the Primary Psychopathy (PP) subscale of the LSRP correlated significantly with Lying Severity in both the Exposure and Non-Exposure Conditions, two 2 X 2 mixed design ANOVAs, one involving the ME subscale and the other involving the PP subscale, were also conducted. Specifically, level of

Figure 3.8. Lying Severity by Psychopathy (PPI-R) and Degree of Exposure to Opponent

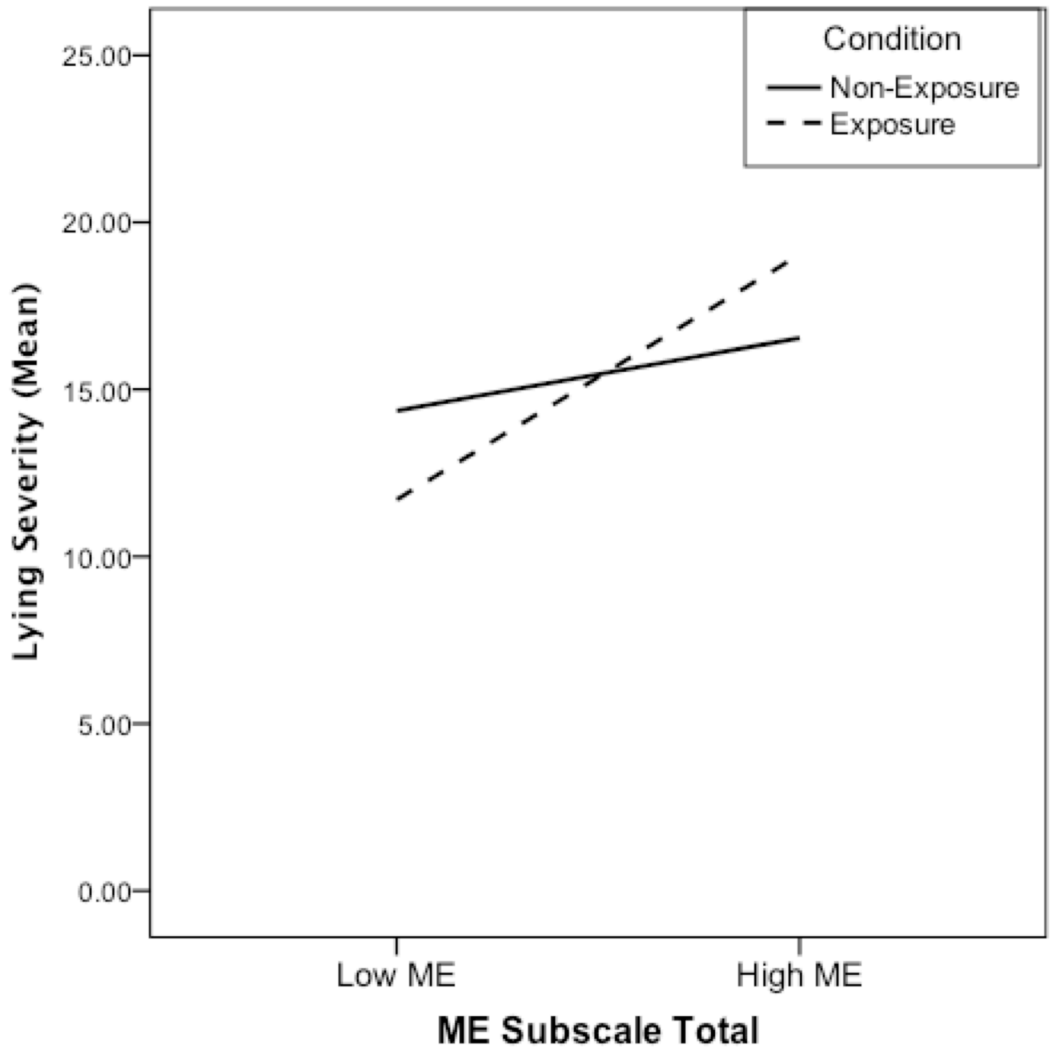


psychopathy/Machiavellianism was the between subjects factor (i.e., high or low on the ME and PP subscales, dichotomized using a median split) and Condition (i.e., Non-Exposure and Exposure) was the within-subjects factor, with lying severity as the dependent variable. Mixed design ANOVAs comparing level of psychopathy (high vs. low) by Condition were conducted on the remaining subscales and these results can be found in Appendix S.

For the ME subscale, there was no significant main effect of Condition, indicating that, overall, participants lied to the same degree in the Non-Exposure Condition as in the Exposure Condition, $F(1, 125) = .003$, $p = .953$, partial $\eta^2 = .000$. There was a significant main effect of Machiavellianism, indicating that high scorers on the ME subscale averaged higher on lying severity than low scorers, $F(1, 125) = 4.291$, $p = .040$, partial $\eta^2 = .033$. The interaction effect was marginally significant, $F(1, 125) = 3.450$, $p = .066$, partial $\eta^2 = .027$, indicating that the effect of condition on lying severity trended towards being different for low scorers on the ME

subscale compared to high scorers. The nature of this effect is displayed in Figure 3.9. As can be seen, on average, high scorers lied to a greater degree than low scorers in both the Non-Exposure and Exposure Conditions. Low scorers on the ME subscale, on average, lied to a lesser extent in the Exposure Condition than the Non-Exposure Condition while high scorers lied to a greater extent in the Exposure Condition than the Non-Exposure Condition.

Figure 3.9. Lying Severity by Psychopathy (ME Subscale) and Degree of Exposure to Opponent



Simple effect analyses showed that differences in lying severity due to Conditions did not occur for low or high scorers on the ME subscale, $t(58) = 1.281$, $p = .205$, $d = .167$ and $t(67) = -1.346$, $p = .183$, $d = -.163$, respectively. These results indicate that lying severity for low scorers

on the ME subscale did not statistically differ in the Non-Exposure and Exposure Conditions; the same was also found for high scorers.

Analyses of the simple effect of level of Machiavellianism on lying severity was significant for the Exposure Condition but not for the Non-Exposure Condition, $t(125) = -2.783$, $p = .006$, $d = -.497$ and $t(125) = -.797$, $p = .427$, $d = -.142$, respectively. These results indicate that low scorers on the ME did not statistically differ from high scorers in the Non-Exposure Condition but did statistically differ from them in the Exposure Condition, with high scorers lying to a greater degree than low scorers.

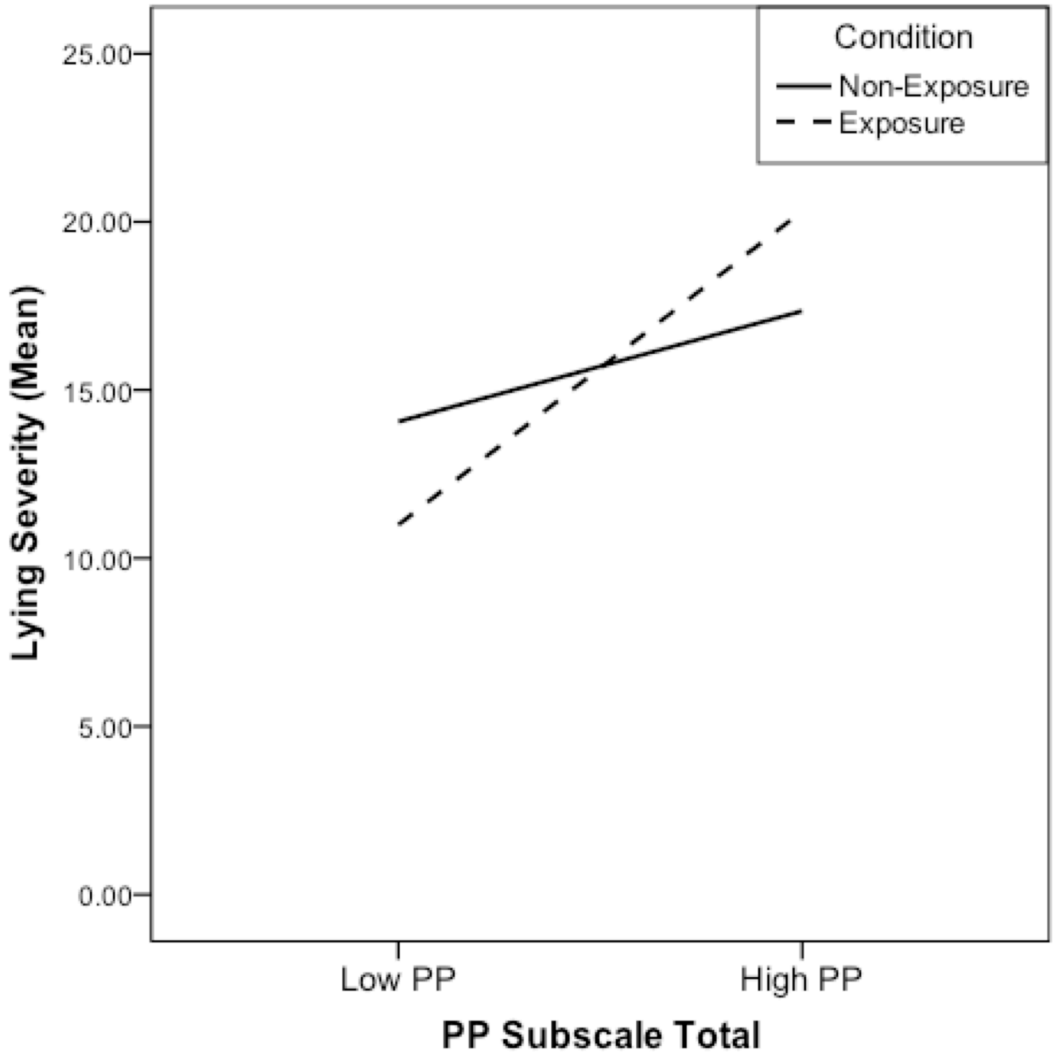
For the PP subscale, there was no significant main effect of Condition, indicating that, overall, participants lied to the same degree in the Non-Exposure Condition as in the Exposure Condition, $F(1, 124) = .001$, $p = .972$, partial $\eta^2 = .000$. There was a significant main effect of psychopathy, indicating that, on average, high scorers on the PP subscale lied to a greater degree than low scorers, $F(1, 124) = 7.661$, $p = .007$, partial $\eta^2 = .058$. The interaction effect was significant, $F(1, 24) = 4.876$, $p = .029$, partial $\eta^2 = .038$, indicating that the effect of Condition on lying severity was different for low scorers on the PP subscale than it was for high scorers. The nature of this effect is displayed in Figure 3.10. As can be seen, on average, high scorers lied to a greater degree than low scorers in both the Non-Exposure and Exposure Conditions. Low scorers on the PP subscale, on average, lied to a lesser extent in the Exposure Condition than the Non-Exposure Condition while high scorers lied to a greater extent in the Exposure Condition than the Non-Exposure Condition.

Simple effect analyses showed that differences in lying severity due to Conditions did not occur for low or high scorers on the PP subscale, $t(64) = 1.531$, $p = .131$, $d = .191$ and $t(60) = -1.609$, $p = .113$, $d = -.206$, respectively. These results indicate that lying severity for low scorers on the ME subscale did not statistically differ in the Non-Exposure and Exposure Conditions; the same was also found for high scorers.

Analyses of the simple effect of level of psychopathy on lying severity was significant for the Exposure Condition but not for the Non-Exposure Condition, $t(124) = -3.603$, $p = .000$, $d = -.640$ and $t(124) = -1.207$, $p = .230$, $d = -.215$, respectively. These results indicate that low scorers on the ME did not statistically differ from high scorers in the Non-Exposure Condition but did statistically differ from them in the Exposure Condition, with high scorers lying to a greater degree than low scorers.

Overall, the results from the mixed ANOVAs partially support the hypothesis that individuals who scored higher on the psychopathy/Machiavellianism measures would lie to a greater degree than those who scored lower, as individuals who scored high on some measures (i.e., Mach-IV Total, LSRP Total and ME and PP subscale but not the PPI-R Total) lied to a greater degree overall than those who scored low on the same measures. Interestingly, simple effect analyses revealed that individuals who scored high on these measures lied to a greater degree than individuals who scored low in the Exposure but not in the Non-Exposure Condition.

Figure 3.10. Lying Severity by Psychopathy (PP Subscale) and Degree of Exposure to Opponent



Lying Frequency and Lying Severity Over Repeated Interactions

In accordance with Wilson et al. (1996), who hypothesized that high and low Machs would behave differently over repeated interactions, and with anecdotal evidence involving psychopathic individuals (Babiak, 1995), it was hypothesized in the present research that higher scores on psychopathy/Machiavellianism measures would be associated with higher rates and greater severities in lying in later but not initial interactions in the Lying Game. Correlations between each of the three measure totals and the dependent variables for trials 1 and 10 of the Exposure and Non-Exposure Conditions are displayed in Table 3.14. As can be seen, correlational analyses revealed a significant positive relationship between the Mach-IV Total and Exposure Lying Frequency in the last trial (trial 10), $r = .252$, $p = .004$, but not in the first trial, $r = .118$, $p = .188$. The difference between these correlations (i.e., first vs. last) was significant (see Meng, Rosenthal, & Rubin, 1992), $Z = 2.317$, $p < .05$. A significant positive correlation was also found between the LSRP Total and Exposure Lying Frequency in the last trial, $r = .254$, $p = .004$, but not in the first trial, $r = .024$, $p = .793$. However, the difference between these correlations was found to be not significant, $Z = -1.220$, $p > .05$. Interestingly, the correlation between the PPI-R and Exposure Lying Frequency in both trials 1 and 10 were not significant ($r = .103$, $p = .248$ and $r = .145$, $p = .104$, respectively).

Correlational analyses also revealed significant positive relationships between Exposure Lying Severity and the Mach-IV, LSRP, and PPI-R for trial 10 ($r = .254$, $p = .004$; $r = .198$, $p = .026$; and $r = .195$, $p = .028$, respectively) but not for trial 1 ($r = .169$, $p = .058$; $r = .074$, $p = .409$; and $r = .155$, $p = .082$, respectively). The difference between the correlations for the Mach-IV and the first trial and the Mach-IV and the last trial was significant, $Z = -2.068$, $p < .05$. As well, the difference between the correlations for the LSRP and the first trial and the LSRP and the last trial was also significant, $Z = -2.318$, $p < .05$. However, the difference between the correlations for the PPI-R and the first trial and the PPI-R and the last trial was not significant, $Z = -.786$, $p > .05$. Lastly, none of the measure totals were significantly correlated with any of the dependent variables in trials 1 or 10 of the Non-Exposure Condition.

Thus, overall, the hypothesis that individuals who were higher on psychopathic tendencies would increase their frequency and severity of lying as trials progressed in the Lying Game relative to those who were lower on psychopathic tendencies was partially supported.

Table 3.14. Correlations Between Measure Totals and Lying Frequency and Lying Severity in the First and Last Trials of the Non-Exposure and Exposure Conditions

	Mach-IV Total[a]	LSRP Total[a]	PPI-R Total	NE Lying Frequency Trial 1	NE Lying Frequency Trial 10	E Lying Frequency Trial 1	E Lying Frequency Trial 10	NE Lying Severity Trial 1	NE Lying Severity Trial 10	E Lying Severity Trial 1
NE Lying Frequency Trial 1	.066	.104	-.052	-						
NE Lying Frequency Trial 10	-.009	.006	-.124	.138	-					
E Lying Frequency Trial 1	.118	.024	.103	.184*	.234**	-				
E Lying Frequency Trial 10	.252**	.254**	.145	.227*	.374**	.359**	-			
NE Lying Severity Trial 1	-.009	.072	.029	.802**	.162	.312**	.301**	-		
NE Lying Severity Trial 10	.036	.065	-.021	.139	.777**	.091	.277**	.207*	-	
E Lying Severity Trial 1	.169	.074	.155	.146	.135	.282**	.282**	.194*	.031	-
E Lying Severity Trial 10	.254**	.198**	.195*	.140	.272**	.851**	.851**	.257**	.252**	.227

Note. NE = Non-Exposure; E = Exposure
n = 127 except for [a]n = 126.
*p < .05. **p < .01.

Sex Differences

No initial hypotheses were generated with respect to sex differences on the dependent variables. While the results from the hierarchical regressions did not find participant sex to be a significant predictor of the dependent variables, further analyses were necessary in order to clarify this relationship. To this end, correlations between all measure totals and dependent variables were run separately for females and males. These results are displayed in Tables 3.15 and 3.16, respectively.

With respect to the correlations amongst the three measures, these were all highly significant (ps < .01) and fell within the small to moderate range for females. For males, these correlations mostly fell within the moderate range and were highly significant (ps < .01), with the exception of the relationship between PPI-R and Mach-IV Totals, r = .221, p = .105. As well, the correlations amongst the three dependent variables were also all highly significant (ps < .01) and fell within the moderate to large range for both females and males, separately.

With respect to the correlations between measure totals and dependent variables, several were found to be significantly correlated, namely these tended to occur within the Exposure Condition. Specifically, Exposure Lying Frequency was significantly correlated with Mach-IV Total for males, r = .349, p = .015, but was only marginally significantly correlated for females, r = .204, p = .073. The difference between these correlations was not statistically significant, (Fisher's) Z = -0.83, p = .407 (see Appendix T for a summary of all correlation comparison results). Exposure Lying Frequency was also significantly correlated with LSRP Total for males, r = .397, p = .005, but not for females, r = .159, p = .164. The difference between these correlations was not statistically significant, Z = -1.38, p = 0.168.

With respect to Exposure Lying Severity, it was significantly correlated with Mach-IV Total for females, r = .276, p = .014, but not for males, r = .234, p = .110. The difference between these correlations was not statistically significant, Z = 0.24, p = 0.810. Exposure Lying Severity was also marginally significantly correlated with LSRP Total for females, r = .202, p = .077, and for males, r = .277, p = .057. The difference between these correlations was not statistically significant, Z = -0.42, p = .675.

As for the other correlations between independent and dependent variables, only LSRP Total and Non-Exposure Lying Frequency was found to be marginally significant for males, r = .253, p = .083, but not for females, r = .079, p = .492. The difference between these correlations

Table 3.15. Correlations Between All Measure Totals and Dependent Variables for Females

	Mach-IV Total	LSRP Total	PPI-R Total	Non-Exposure Lying Frequency	Exposure Lying Frequency	Non-Exposure Lying Severity
LSRP Total[a]	.614**	-				
PPI-R Total[a]	.376**	.532**	-			
Non-Exposure Lying Frequency	.079	.079	-.028	-		
Exposure Lying Frequency	.204	.159	.052	.633**	-	
Non-Exposure Lying Severity	-.057	-.004	-.080	.842**	.575**	-
Exposure Lying Severity	.276*	.202	.135	.532**	.889**	.512**

$n = 78$ except for [a]$n = 95$.
*$p < .05$. **$p < .01$.

Table 3.16. Correlations Between All Measure Totals and Dependent Variables for Males

	Mach-IV Total	LSRP Total	PPI-R Total	Non-Exposure Lying Frequency	Exposure Lying Frequency	Non-Exposure Lying Severity
LSRP Total	.645**[a]	-				
PPI-R Total	.221[a]	.471**[a]	-			
Non-Exposure Lying Frequency	.235[b]	.253[b]	-.001	-		
Exposure Lying Frequency	.349*[b]	.397**[b]	.131	.457**	-	
Non-Exposure Lying Severity	.210[b]	.234[b]	.075	.894**	.463**	-
Exposure Lying Severity	.234[b]	.277[b]	.099	.401**	.919**	.409**

$n = 49$ except for [a]$n = 55$ and [b]$n = 48$.
*$p < .05$. **$p < .01$

was not statistically significant, $Z = -0.95$, $p = .343$. Of the remaining correlations, these were small and non-significant for both females and males, separately, and in a few instances for females and in one case for males, negative. As well, Fisher's Z-tests did not reveal any significant differences between these correlations in males and females.

Correlations between all of subscale totals and dependent variables were also computed separately for females and males. These results are displayed in Tables 3.17 and 3.18, respectively. With respect to the correlations amongst the subscales, many were statistically significant at $p < .05$ or $p < .01$ for females and males, though females and males differed somewhat with respect to which specific pairs were significantly correlated. As well, for females, correlations tended to fall within the small to moderate range while for males, correlations tended to fall within the moderate to large range.

With respect to the correlations between the subscale totals and dependent variables, several were found to be significantly correlated, namely these tended to occur within the Exposure Condition. Specifically, Exposure Lying Frequency was significantly correlated with the Primary Psychopathy subscale for females, $r = .274$, $p = .015$, and for males, $r = .383$, $p = .007$. The difference between these correlations was not statistically significant, $Z = -.065$, $p = .516$ (see Appendix U for a summary of all correlation comparison results). Exposure Lying Frequency was also significantly correlated with Machiavellian Egocentricity (ME) for males, $r = .343$, $p = .016$, but not for females, $r = .109$, $p = .342$. The difference between these correlations was not statistically significant, $Z = -.132$, $p = .187$. Additionally, Exposure Lying Frequency was significantly correlated with Blame Externalization (BE) for females, $r = .229$, $p = .043$, but not for males, $r = .023$, $p = .877$. The difference between these correlations was not statistically significant, $Z = 1.12$, $p = .263$.

With respect to Exposure Lying Severity, it was significantly correlated with Primary Psychopathy for females, $r = .336$, $p = .003$, but only marginally significantly correlated for males, $r = -.275$, $p = .059$. The difference between these correlations was not statistically significant, $Z = 0.36$, $p = .719$. There was a marginally significant correlation between Exposure Lying Severity and Machiavellian Egocentricity (ME) for females, $r = .189$, $p = .098$, and for males, $r = .265$, $p = .066$. The difference between these correlations was not statistically significant, $Z = -0.43$, $p = .667$. Additionally, Exposure Lying Severity was significantly correlated with Blame Externalization (BE) for females, $r = .263$, $p = .020$, but not for males, $r =$

-0.32, $p = .829$. The difference between these correlations was not statistically significant, $Z = 1.61$, $p = .107$.

As for the rest of the correlations between subscale totals and dependent variables, marginally significant correlations were found for the following pairs: Primary Psychopathy and Non-Exposure Lying Frequency, and Primary Psychopathy and Non-Exposure Lying Severity for males, $r = .278$, $p = .056$ and $r = .265$, $p = .068$, but not for females. The difference between these correlations was not statistically significant. As well, Exposure Lying Frequency was found to be marginally correlated with Stress Immunity for females, $r = -.191$, $p = .095$, but not for males. The difference between these correlations was not statistically significant.

Of the remaining correlations, these tended to be small and non-significant for both females and males, separately, and in a few instances, negative. As well, Fisher's Z-tests largely did not reveal any significant differences between these correlations in males and females, with the exception of three instances where correlations were marginally significantly different between the two. Specifically, the correlation between Secondary Psychopathy and Exposure Lying Frequency was marginally different in males and females, $Z = -.167$, $p = .095$, the correlation between Social Influence (SOI) and Exposure Lying Frequency was also marginally different in males and females, $Z = 1.81$, $p = .070$, and the correlation between Social Influence (SOI) and Exposure Lying Severity was also marginally different in males and females, $Z = 1.88$, $p = .060$.

Table 3.17. Correlations Between All Subscale Totals and Dependent Variables for Females

Measure/Scale	PP	SP	ME	RN	BE	CN	SOI	F	STI	C
SP	.345**	-								
ME	.657**	.419**	-							
RN	.279**	.335**	.315**	-						
BE	.318**	.454**	.418**	.133	-					
CN	.244*	.669**	.343**	.490**	.249*	-				
SOI	.121	-.102	.171	.338**	.102	.025	-			
F	.071	.097	.045	.546**	.149	.159	.424**	-		
STI	-.068	.040	-.120	.180	-.291**	.072	.180	.218*	-	
C	.378**	.343**	.328**	.229*	.222*	.508**	-.046	.035	.071	-
Non-Exposure Lying Frequency[a]	.170	-.097	.031	-.013	.167	-.095	-.022	-.133	-.157	.032
Exposure Lying Frequency[a]	.274*	-.086	.109	-.012	.229*	-.044	.103	-.089	-.191	.054
Non-Exposure Lying Severity[a]	.098	-.162	-.033	-.094	.033	-.147	.051	-.177	-.052	-.076
Exposure Lying Severity[a]	.336**	-.093	.189	.067	.263*	.021	.148	-.046	-.182	.088

Note. PP = Primary Psychopathy; SP = Secondary Psychopathy; ME = Machiavellian Egocentricity; RN = Rebellious Nonconformity; BE = Blame Externalization; CN = Carefree Nonplanfulness; SOI = Social Influence; F = Fearlessness; STI = Stress Immunity; C = Coldheartedness. $n = 95$ except for $^{a}n = 78$.
$^{*}p < .05$. $^{**}p < .01$.

Table 3.18. Correlations Between All Subscale Totals and Dependent Variables for Males

Measure/Scale	PP	SP	ME	RN	BE	CN	SOI	F	STI	C
SP	.321*[a]	-								
ME	.866**[a]	.307*[a]	-							
RN	.075[a]	.471**[a]	.070	-						
BE	.242[a]	.643**[a]	.241	.519**	-					
CN	.194[a]	.730**[a]	.179	.581**	.513**	-				
SOI	-.017[a]	-.329*[a]	.089	.063	-.189	-.225	-			
F	.050[a]	-.059[a]	.080	.385**	.033	-.011	.395**	-		
STI	-.181[a]	-.522**[a]	-.227	-.113	-.306*	-.217	.295*	.273*	-	
C	.543**[a]	-.042[a]	.377**	-.160	-.134	.024	-.131	-.092	.215	-
Non-Exposure Lying Frequency	.278[c]	.088[c]	.076[b]	.025[b]	-.113[b]	.067[b]	-.153[b]	-.101[b]	-.085[b]	.163[b]
Exposure Lying Frequency	.383**[c]	.224[c]	.343*[b]	.111[b]	.023[b]	.124[b]	-.231[b]	-.047[b]	-.047[b]	.204[b]
Non-Exposure Lying Severity	.265[c]	.069[c]	.083[b]	.124[b]	-.121[b]	.144[b]	-.099[b]	-.077[b]	-.026[b]	.134[b]
Exposure Lying Severity	.275[c]	.143[c]	.265[b]	.087[b]	-.032[b]	.090[b]	-.200[b]	-.037[b]	-.013[b]	.187[b]

Note. PP = Primary Psychopathy; SP = Secondary Psychopathy; ME = Machiavellian Egocentricity; RN = Rebellious Nonconformity; BE = Blame Externalization; CN = Carefree Nonplanfulness; SOI = Social Influence; F = Fearlessness; STI = Stress Immunity; C = Coldheartedness.
n = 56 except for [a]n = 55, [b]n = 49, and [c]n = 48.
*$p < .05$. **$p < .01$.

Self-Perceived Lying Behaviour

Participants were asked to respond to several questions related to self-perceived lying behaviour on the Post-Experiment Questionnaire – Part 2. The majority of these questions were drawn directly from Klaver et al. (2007). Table 3.19 displays the frequency of responses for the first question: "Compared to others, how good are you at lying? As can be seen, "Average" was the most commonly endorsed response (29.5%), followed closely by "Below Average" (28.2%) and "Above Average" (28.2%). Question 2 asked participants: "How do you generally feel when you know that you have successfully deceived another person?" Participants were permitted to select more than one response. Table 3.20 displays the frequency of responses for this question. The most commonly endorsed affective response to the question was "Guilty." Examples of feelings from those who endorsed the "Other" response included: "relieved," "indifference," "satisfaction," "proud," "content," and "regretful."

For Question 3, participants were asked: "In general, how often do you lie in a week?" The most frequent response was "Rarely" (62.9%) followed by "Sometimes" (24.5%; see Table 3.21). Interestingly, nine participants (6%) indicated that they "Never" lied in a week (Question 3) and another ten participants indicated that they either lied "Often" or "Very Often" in a week. For exploratory purposes, cross tabulation frequencies for those who answered "Never" to Question 3 by Question 1 ("Compared to others, how good are you at lying?") and for those who answered "Often" or "Very Often" to Question 3 by Question 1 are displayed in Appendix V. Results indicated that 2 of the 9 participants who "Never" lied in a week perceived themselves as having "Above Average" lying abilities. On the other hand, 7 of the 10 participants who "Often" or "Very Often lied in a week perceived themselves as having "Above Average" or "Very Much Above Average" lying abilities.

Further, means and standard deviations for the psychopathy/Machiavellianism measures, as well as for the dependent variables for the "Never" group and "Often" or "Very Often" group are displayed in Appendix W and X, respectively. Participants in the "Never" group, on average, scored lower on all measures and dependent variables compared to the overall means reported in Tables 3.3 and 3.7 while participants in the "Often" or "Very Often" group scored higher, on average, relative to the overall means reported in the same tables.

Table 3.19. Frequency of Responses for the Question: "Compared to others, how good are you at lying?"

	Frequency (n = 149)	Percent
Very Much Below Average	17	11.4
Below Average	42	28.2
Average	44	29.5
Above Average	42	28.2
Very Much Above Average	4	2.7

Table 3.20. Frequency of Responses for the Question: "How do you generally feel when you know that you have successfully deceived another person?"

	Yes (Percent)	No (Percent)
Excited	27 (17.9)	124 (82.1)
Nervous/Anxious	67 (44.4)	84 (55.6)
Scared/Worried	44 (29.1)	107 (70.9)
Guilty	102 (67.5)	49 (32.5)
Other	19 (12.6)	132 (87.4)

n = 151 for each row

Table 3.21. Frequency of Responses for the Question: "In general, how often do you lie in a week?"

	Frequency (n = 151)	Percent
Never	9	6.0
Rarely	95	62.9
Sometimes	37	24.5
Often	9	6.0
Very Often	1	0.6

In order to examine the relationship between self-perceived lying behaviour and psychopathy/Machiavellianism, correlational analyses were conducted on both the measure and subscale totals and on the responses to the first 3 questions of the Post-Experiment Questionnaire – Part 2. Correlations between the measure totals and responses to the three questions are displayed in Table 3.22 while the correlations between the subscale totals and responses to the three questions are displayed in Table 3.23.

As shown in Table, 3.22, correlations amongst the responses to the three questions were in the expected direction. For example, higher self-perceived lying ability (Question 1) was positively and significantly related to feeling excited, $r = .298$, $p = .001$, but negatively and significantly related to feeling guilty, $r = -.239$, $p = .003$, after having successfully deceived others (Question 2). As well, higher self-perceived lying ability (Question 1) was also positively and significantly related to higher self-reported lying frequency over the course of a week (Question 3), $r = .385$, $p = .015$.

Correlations between the responses to the three questions and the measures totals were also mostly in the expected direction. Higher scores on the psychopathy and Machiavellianism measures were positively and significantly related to higher levels of self-perceived lying ability (Question1); feeling excited but not guilty after having successfully deceived others (Question 1); higher self-reported lying frequency over the course of a week (Question 3); and being male (as aforementioned, the sex variable was dummy coded with females = 0 and males = 1). The correlations between psychopathy/Machiavellianism totals and feeling nervous/anxious or scared/worried after having successfully deceived others (Question 2) were mostly positive and, in a few cases, significant, though they were also mostly of small magnitude.

Intercorrelations amongst subscales (Table 3.23) were previously reported and thus will not be further discussed here. Correlations between the responses on the three questions and subscale totals showed patterns that were similar to that of the measure totals. That is, higher scores on subscales were mostly positively and significantly related to higher ratings on self-perceived lying ability (Question 1); feeling excited but not guilty after having successfully deceived others (Question 2); higher self-reported lying frequency over the course of a week (Question 3); and being male. The correlations between subscale totals and feeling nervous/anxious or scared/worried after having successfully deceived others (Question 2) were mostly negative, non-significant, and of small magnitude.

Table 3.22. Correlations Between Responses on the Post-Experiment Questionnaire - Part 2, Gender, and All Measure Totals

	Q1	Excited	Nervous/ Anxious	Scared/ Worried	Guilty	Other	Q3	Mach-IV Total	LSRP Total	PPI-R Total
Q1: Compared to others, how good are you at lying?	-									
Q2: Excited	.278**[a]	-								
Q2: Nervous/Anxious	.043[a]	.001	-							
Q2: Scared/Worried	.035[a]	-.071	.395**	-						
Q2: Guilty	-.239**[a]	-.230**	.021	.102	-					
Q2: Other	.198*[a]	.084	-.299**	-.243**	-.462**	-				
Q3: In general, how often do you lie in a week?	.385**[a]	.300**	.156	.118	-.142	.109	-			
Mach-IV Total	.425**[b]	.252**[c]	.198*[c]	.083[c]	-.419**[c]	.152[c]	.292**[c]	-		
LSRP Total	.288**[b]	.349**[c]	.191*[c]	.026[c]	-.376**[c]	.126[c]	.354**[c]	.645**[c]	-	
PPI-R Total	.311**[a]	.258**	-.075	.160*	-.296**	.250**	.304**	.391**[c]	.523**[c]	-
Gender	.354**[a]	.214**	-.134	-.191*	-.288**	.287**	.191*	.323**[c]	.186*[c]	.382**

Note. Q2 = How do you generally feel when you know that you have successfully deceived another person?
$n = 151$ except for [a]$n = 149$, [b]$n = 148$, and [c]$n = 150$.
*$p < .05$. **$p < .01$.

Table 3.23. Correlations Between Responses on the Post-Experiment Questionnaire - Part 2, Gender, and All Subscale Totals

	PP	SP	ME	RN	BE	CN	SOI	F	STI	C	Gender	Q1	Q2: a	Q2: b	Q2: c	Q2: d	Q2: e
SP	.332^{**a}	-															
ME	.784^{**a}	.357^{**a}	-														
RN	.201^{*a}	.404^{**a}	.220**	-													
BE	.266^{**a}	.530^{**a}	.316**	.295**	-												
CN	.254^{**a}	.692^{**a}	.294**	.553**	.351**	-											
SOI	.068^{a}	-.200^{*a}	.143	.219**	-.010	-.070	-										
F	.107^{a}	.038^{a}	.114	.490**	.102	.130	.416**	-									
STI	-.023^{a}	-.191^{*a}	-.057	.104	-.280**	.021	.233**	.301**	-								
C	.504^{**a}	.145^{a}	.407**	.078	.052	.304**	-.059	.056	.243**	-							
Gender	.227^{**a}	.037^{a}	.254**	.177*	-.014	.202*	.064	.230**	.377**	.321**	-						
Q1	.300^{**b}	.141^{b}	.420^{**c}	.215^{**c}	.113^{c}	.185^{*c}	.114^{c}	.172^{*c}	.098^{c}	.148^{c}	.354^{**c}	-					
Q2: Excited (a)	.311^{**a}	.252^{**a}	.370**	.172*	.221**	.230**	-.007	.039	-.009	.254**	.214**	.278^{*c}	-				
Q2: Nervous/ Anxious (b)	.129^{a}	.203^{*a}	.103	-.025	.086	.097	-.090	-.144	-.260**	.027	-.134	.043^{c}	.001	-			
Q2: Scared/ Worried (c)	-.030^{a}	.104^{a}	-.023	-.050	.069	-.031	-.085	-.061	-.297**	-.095	-.191*	.035^{c}	-.071	.395**	-		
Q2: Guilty (d)	-.399^{**a}	-.171^{*a}	-.390**	-.123	-.140	-.285**	-.025	.007	-.075	-.341	-.288**	-.239^{**c}	-.230**	.021	.102	-	
Q2: Other (d)	.137^{a}	.052^{a}	.135	.131	-.005	.242**	.000	.064	.303**	.256**	.287**	.198^{*c}	.084	-.299**	-.243**	-.462**	-
Q3	.325^{**a}	.242^{**a}	.430**	.173*	.176*	.216**	.129	.111	.000	.232**	.191*	.385^{**c}	.300**	.156	.118	-.142	.109

Note. PP = Primary Psychopathy; SP = Secondary Psychopathy; ME = Machiavellian Egocentricity; RN = Rebellious Nonconformity; BE = Blame Externalization; CN = Carefree Nonplanfulness; SOI = Social Influence; F = Fearlessness; STI = Stress Immunity; C = Coldheartedness. Q1 = Compared to others, how good are you at lying? Q2 = How do you generally feel when you know that you have successfully deceived another person? Q3: In general, how often do you lie/week?
n = 151 except for ^{a}n = 150, ^{b}n = 148, and ^{c}n = 149.
$^{*}p < .05$. $^{**}p < .01$.

Table 3.24 displays the correlations between responses on the first 3 questions of the Post-Experiment Questionnaire – Part 2 and the dependent variables. Contrary to expectations, almost none of these correlations were highly significant or of sizable magnitude, with the exception of the negative and significant correlations between feeling "Guilty" after having successfully deceived others (Question 2) and Exposure Lying Frequency and Severity. Though the magnitude of these correlations was small, they were in the expected direction (i.e., the more likely one is to lie and to lie to a greater degree in the Exposure Condition, the less likely one is to feel guilty about doing so).

Table 3.24. Correlations Between Responses on the Post-Experiment Questionnaire and Dependent Variables

	Q1	Excited	Nervous/ Anxious	Scared/ Worried	Guilty	Other	Q3	NE Frequency	E Frequency	NE Severity
Q1: Compared to others, how good are you at lying?	-									
Q2: Excited	.278**[a]	-								
Q2: Nervous/Anxious	.043[a]	.001	-							
Q2: Scared/Worried	.035a	-.071	.395**	-						
Q2: Guilty	-.239**[a]	-.230**	.021	.102	-					
Q2: Other	.198*[a]	.084	-.299**	-.243**	-.462**	-				
Q3: In general, how often do you lie in a week?	.385**[a]	.300**	.156	.118	-.142	.109	-			
Non-Exposure Lying Frequency	-.057[b]	.007[c]	.085[c]	-.048[c]	.046[c]	-.072[c]	-.006[c]	-		
Exposure Lying Frequency	.015[b]	.089[c]	-.012[c]	.014[c]	-.194*[c]	.033[c]	.105[c]	.566**[c]	-	
Non-Exposure Lying Severity	.018[b]	.012[c]	.057[c]	-.108[c]	-.038[c]	.027[c]	-.006[c]	.847**[c]	.523**[c]	-
Exposure Lying Severity	.020[b]	.081[c]	-.023[c]	.024	-.242**[c]	.058[c]	.088[c]	.461**[c]	.892**[c]	.467**[c]

Note. Q2 = How do you generally feel when you know that you have successfully deceived another person? NE = Non-Exposure; E = Exposure.
n = 151 except for [a]n = 149, [b]n = 125, and [c]n = 127.
*p < .05. **p < .01

CHAPTER 4

DISCUSSION

The present research examined the relationship between psychopathy and lying among university students who had met, or had not met, the other player in a modified Trust Game called the Lying Game. Specifically, lying frequency and lying severity were examined in the study. Overall, the results suggested that lying frequency and lying severity were related to psychopathy when participants were provided with the opportunity to see and interact with their opponents but not when they were not provided with such an opportunity. Differences between males and females on lying frequency and lying severity were not significant across the two conditions, though males obtained significantly higher scores on the psychopathy and Machiavellianism measures than females. The results on a post-experiment self-report measure also suggested that psychopathy was related to certain characteristics of self-perceived lying behaviour, though the latter was not related to lying behaviour in the Lying Game.

Reliability and Validity of the Machiavellianism and Psychopathy Self-Report Measures

Consistent with previous findings (Billings, 2004; Levenson et al., 1995; Lilienfeld & Widows, 2005; McHoskey et al., 1998), the present results provide further support for the validity and reliability of the Mach-IV, LSRP, and PPI-R. Specifically the uniformly high alphas across the measures indicated good internal consistency. The significant correlations between the LSRP and the PPI-R, and the conceptually meaningful intercorrelations amongst the measure subscales suggested satisfactory construct validity. As well, the substantive correlations amongst the Mach-IV, LSRP and PPI-R totals are consistent with the view that Machiavellianism is related to psychopathy (McHoskey et al., 1998). Further, the ability of the three measures to predict lying frequency and severity in the Exposure but not in the Non-Exposure Condition suggested satisfactory criterion-related validity. Though this relationship was not initially hypothesized, it is consistent with aspects of the psychopathic personality as depicted in clinical writings. This relationship is further elaborated upon below.

The Lying Game

Lying Frequency

As aforementioned, despite the popular claim that psychopathic individuals are prolific liars, lying frequency has not been previously examined using behavioural measures within the psychopathy research literature. The results of the present study, however, lend some support to this assertion. Specifically, Mach-IV, LSRP, and PPI-R Total scores were collectively found to predict lying frequency in the Exposure but not in the Non-Exposure Condition. While these measures were developed with a dimensional rather than a categorical approach to interpretation in mind, psychopathy/Machiavellianism Total scores were dichotomized in the present research using a median split in order to obtain a crude assessment of differences between groups (i.e., high and low on psychopathy/Machiavellianism) within the two Conditions (Non-Exposure and Exposure).

When the median split was applied and differences in lying frequency between individuals who were high and low on psychopathic/Machiavellian tendencies were examined, results suggested that individuals who were high on the Mach-IV and LSRP lied moderately more overall than those who were low on these measures. However, no significant differences were found between high and low scorers overall on the PPI-R. Thus, the hypothesis that individuals who were higher on psychopathic tendencies would lie more than those who were lower was partially supported by these results. The differential findings between lying frequency and the PPI-R compared to the Mach-IV and LSRP is notable and may be due to several factors.

First, as aforementioned, a median split was used to dichotomize the psychopathy/Machiavellianism variable. Dichotomizing a variable generally causes significant alterations to the nature of the original information (Field, 2009), usually resulting in decreased variability in the data and thus a loss of precision. This may have been especially relevant in the case of the PPI-R Total scores.

Second, compared to the Mach-IV and LSRP, the PPI-R is a longer and much more heterogeneous measure (as indicated by the modest intercorrelations) that assesses the many features of psychopathy using eight separate subscales. As such, any two individuals may have different elevations and declinations across subscales and still arrive at similar PPI-R Total scores. Thus, it is possible that different individual subscale or combination of subscale elevations (i.e., exhibiting varying levels of the different features of psychopathy) may be more

relevant to the prediction of lying frequency than the sum of all subscale elevations (i.e., the PPI-R Total). Descriptive analyses revealed that the highest correlation between the PPI-R subscales and lying frequency was that involving the Machiavellian Egocentricity (ME) subscale within the Exposure Condition. However, post hoc analyses did not find the ME subscale to be a significant predictor of lying frequency. Post hoc analyses also did not find any of the other PPI-R subscales to be significant predictors of lying frequency.

Thus, a third possible explanation for the differential findings between lying frequency and the PPI-R compared to the Mach-IV and the LSRP is simply that the PPI-R is a poorer predictor of lying frequency overall compared to the other two measures. Indeed, post hoc analyses pairing each of the three measures in turn found that when the Mach-IV and LSRP were each paired with the PPI-R separately, they each contributed uniquely to the prediction of lying frequency while the PPI-R did not. Interestingly, when the Mach-IV and LSRP were paired simultaneously, the unique variance disappeared suggesting that there is a fair amount of overlapping variance between the two measures in the prediction of lying frequency. Therefore, combining the three measures together may have obscured the unique variance contributions of the Mach-IV and LSRP. Additionally, when the Primary Psychopathy subscale of the LSRP was used in place of the LSRP Total, it was found to be a significant individual predictor of lying frequency in both the Exposure and Non-Exposure Conditions, suggesting that it has a greater impact on the prediction of lying frequency than any of the other measures. As well, this finding suggests that the affective and interpersonal aspects of psychopathy may be more important than the behavioural aspects in the prediction of lying frequency. It is also consistent with the notion that there may be different subtypes of the disorder (e.g., Hervé, 2003; Poythress & Skeem, 2006).

Indeed, traditional accounts of psychopathy (i.e., Cleckley, 1976) have focused on individuals who possess the core personality features (i.e., affective and interpersonal aspects) of the disorder (e.g., pathological lying, superficial charm, lack of empathy, etc.) but who have managed to refrain from or evade detection for engaging in serious antisocial behaviour. They are therefore more likely to score higher on Factor 1 of the PCL-R than on Factor 2 (Hare, 2003). Such individuals have been referred to in the clinical and research literature as “successful” psychopaths (Hall & Benning, 2006), “industrial psychopaths” (Babiak, 1995), “white-collar” psychopaths (Hare, 1993), “subclinical” psychopaths (Hare, 1993) or “primary” psychopaths

(Blackburn, 1998). According to Blackburn, primary psychopaths are dominant, confident, extroverted, and low to average in anxiety, whereas "secondary" psychopaths are withdrawn, socially anxious, and average to high in anxiety (Blackburn, 1998). Although it has been suggested that these (i.e., primary psychopaths) individuals could be found across many different walks of life, they appear to be drawn to occupations that are associated with power, authority, and prestige (e.g., business, law, military, etc; Hare, 1993). As such, future research should continue to investigate lying behaviour in individuals with psychopathic tendencies in the community in order to clarify which aspects of psychopathy and correspondingly which measures are predictive of lying frequency in this population.

With respect to lying frequency overall, there were no significant differences between the Non-Exposure and Exposure Conditions. However, individuals scoring low on the Mach-IV and LSRP Totals, and ME and PP subscales averaged lower rates of lying in the Exposure Condition relative to the Non-Exposure Condition, though these differences were not significant. On the other hand, individuals scoring high on each of these measures averaged slightly higher rates of lying in the Exposure compared to the Non-Exposure Condition, though these differences were also not significant. At first glance, this latter result is consistent with the hypothesis that individuals who are higher on psychopathic tendencies are just as likely to lie to an acquaintance as to a stranger. However, the weak trends toward slightly higher rates of lying for individuals scoring high on these measures and toward slightly lower rates of lying for individuals scoring low on these measures in the Exposure relative to the Non-Exposure Condition is notable. Further, it is these slight decreases and increases in lying frequency that contribute to the significant difference found between high and low scorers on the LSRP Total and PP subscale in the Exposure Condition but not in the Non-Exposure Condition.

Differences in lying frequency between low and high scorers as a result of having seen and interacted with the other person compared to not having done so can be elucidated by findings from past research. Specifically, one possible reason for the slight decrease in the rate of lying from the Non-Exposure to the Exposure Condition for low scorers may be related to the concept of deindividuation, which refers to the idea that people tend to become more disinhibited or more likely to violate social norms when they are not seen as individuals (Festinger, Pepitone, & Newcomb, 1952). In the now classic study, Diener, Fraser, Beaman, and Kelem (1976) studied the concept in child trick-or-treaters, who had been instructed to take only one piece of candy

from a bowel that had seemingly been left unattended. The researchers found that individuals who were in the nonanonymous/identified condition (i.e., had been asked to identify their name and where they lived) were significantly less likely (i.e., 7.5% vs. 21.4%) to steal extra candy than individuals in the anonymous condition (i.e., had not been asked any identification questions). Applying the idea of deindividuation to the present study, it is possible that the low scorers may have inhibited their lying behaviour in the Exposure Condition relative to the Non-Exposure Condition due to the condition of anonymity in the latter but not in the former.

Alternatively, another possible reason for the slight decrease in lying rates in low scorers from the Non-Exposure to the Exposure Conditions can by illustrated by the results of a study by Bohnet and Frey (1999). They found that individuals playing non-zero-sum games were more likely to allocate more money to the other player when they had seen and learned something about them (i.e., their name, university major, hobby, birth place) compared to when they played the game anonymously. The former appeared to elicit empathy in the allocator by decreasing "social distance" between the two players while the latter did not. Given these findings and the consistent (clinical and empirical) observation that individuals who are higher on psychopathic and Machiavellian tendencies exhibit lower levels of empathy than those who are lower on such tendencies (Blair et al., 2005; Montagne et al., 2005), it is plausible that seeing and interacting with their opponent activated empathy in low scorers, but not high scorers, causing the former to lie less frequently relative to when they were not provided with the opportunity to see and interact with their opponent.

On the other hand, although high scorers did not statistically differ on rates of lying from one condition to the other, there was a weak trend toward slightly higher rates of lying in the Exposure Condition compared to the Non-Exposure Condition. Previous research has found that high Machs were more likely than low Machs to excel in situations where they were able to communicate with and observe those with whom they were interacting, likely because this allowed them to assess social cues (Christie & Geis, 1970). Past research has also found that high Machs were more likely than low Machs to take advantage of trusting individuals (Harrel & Hartnagel, 1976).

These findings are also consistent with what one would expect from individuals who are higher on psychopathic tendencies given the interpersonal and affective features associated with the disorder (e.g., glibness/superficial charm, manipulativeness, lack of remorse and empathy).

They may also explain why previous studies examining lying ability have failed to find significant differences between psychopathic and nonpsychopathic individuals, as they have largely been non-interactive in design (i.e., instructing individuals to lie on video and leaving them uninformed with respect to who their target audience is). This would seem to prevent the ability of psychopathic individuals to tailor their lies or appropriately "turn on the charm," consequently diminishing, perhaps, their effectiveness or credibility to the target. Further, the lack of interaction in previous studies disregards the importance and influence of the other side of the equation: the characteristics of the target him/herself. That is, they failed to consider the possibility that psychopathic individuals may appear to be more successful at lying simply because they may be more likely to take advantage of or better at selecting vulnerable targets or favourable circumstances in which to direct their dissimulations than nonpsychopaths.

Although not explicitly examined, there appears to be some evidence to support this claim in the present study. Specifically, while both the Non-Exposure and Exposure Conditions allowed participants to interact with their opponents or "targets," the Exposure Condition allowed participants the opportunity to observe and size up their opponent. Perhaps in so doing, high scorers assessed him/her to be an easy target, prompting them to increase their rate of lying for possible self-benefit. A cursory review of participants' open-ended descriptions of their opponent in the Exposure Condition revealed that common descriptors for both the male and female "opponent" (i.e., confederate) included such adjectives as "honest," "friendly," "kind," "nice," and "trusting." Unfortunately, participants were not also asked to report their inferences on the characteristics of their opponent in the Non-Exposure Condition and thus these could not be reported for comparison.

Lying Severity

Although rates of lying have previously been examined in psychopathic individuals using a self-report measure, lying severity has apparently never been previously examined empirically in this population. However, based on research from the Machiavellianism literature, which has found that high Machs are more willing and likely to tell bigger lies than low Machs (Geis et al., 1970), it was hypothesized in the present research that individuals scoring high on psychopathic/Machiavellian tendencies would also lie to a greater degree than those scoring low on such tendencies. This hypothesis was partially supported by the results of the present study.

Specifically, Mach-IV, LSRP, and PPI-R Total scores were collectively found to predict lying severity in the Exposure but not in the Non-Exposure Condition.

As with lying frequency, dichotomized psychopathy/Machiavellianism Total scores were also used to obtain a crude assessment of differences between groups (i.e., high and low on psychopathy/Machiavellianism) within the two Conditions (Non-Exposure and Exposure) on the lying severity variable. Results pertaining to lying severity were similar to those obtained for lying frequency. Specifically, results suggested that individuals who were high on the Mach-IV and LSRP Totals, and the ME and PP subtotals were significantly more likely to lie to a greater degree overall than those who were low on these measures. In contrast, no significant differences were found between high and low scorers overall on the PPI-R. Thus, the hypothesis that individuals who were higher on psychopathic tendencies would lie to a greater degree than those who were lower was partially supported by these results. The differential findings between lying severity and the PPI-R compared to the Mach-IV and LSRP are likely due to the same factors described above for lying frequency.

Interestingly, post hoc analyses conducted to examine the relative impact of the three measures and a few of the subscales on the prediction of lying severity were also quite similar to that of parallel analyses conducted with lying frequency. Specifically, post hoc analyses suggested that Mach-IV and LSRP each contributed uniquely to the prediction of lying severity while the PPI-R did not when measures were paired in turn. Post hoc analyses also suggested that there was a fair amount of overlapping variance between the Mach-IV and LSRP in the prediction of lying severity and that combining the three measures together may have obscured the unique variance contributions of these two measures. A similar pattern was also found when the ME subscale was paired with the Mach-IV and LSRP separately, suggesting that there may be a substantial amount of shared variance among these three measures in the prediction of lying severity. Additionally, when the Primary Psychopathy subscale of the LSRP was used in place of the LSRP Total, it was found to be a marginally significant individual predictor of lying severity in the Exposure Condition and a significant individual predictor of lying severity in the Non-Exposure Condition. This suggests that the PP subscale may have a greater impact on the prediction of lying severity than any of the other measures. Again, these finding are consistent with indications that there are different subtypes of psychopathy (e.g., Hervé, 2003; Poythress & Skeem, 2006).

With respect to lying severity overall, there were no significant differences between the Non-Exposure and Exposure Conditions. However, individuals scoring low on the Mach-IV, LSRP, and PPI-R Totals and the ME and PP subtotals lied to a lesser degree overall in the Exposure Condition relative to the Non-Exposure Condition, though these differences were not significant. On the other hand, individuals scoring high on each of these measures lied to a greater degree overall in the Exposure compared to the Non-Exposure Condition, though these differences were also not significant. Initially, this latter result appears to suggest that individuals who are higher on psychopathic tendencies lie to a similar degree to acquaintances and strangers alike. However, the weak trends toward slightly greater degrees of lying for individuals scoring high on these measures and slightly lesser degrees of lying for individuals scoring low on these measures in the Exposure relative to the Non-Exposure condition is noteworthy. Further, it is these slight decreases and increases in lying severity that contribute to the significant difference found between high and low scorers on the Mach-IV, LSRP, and PPI-R Totals and on the PP and ME subscales in the Exposure Condition but not in the Non-Exposure Condition.

The same reasons suggested for the differences in lying frequency across the two conditions between high and low scorers on the psychopathy/Machiavellianism measures may also account for the parallel differences observed in lying severity. Specifically, seeing and interacting with their opponent may have activated empathy in low scorers, but not high scorers, causing them to lie to a lesser degree relative to when they were not provided with the opportunity to see and interact with their opponent. On the other hand, high scorers may have sized up their opponent in the Exposure Condition as an easy target, prompting them to lie to a greater degree relative to the Non-Exposure Condition where they were not provided with any such cues.

Lying Frequency and Lying Severity Over Repeated Interactions

Babiak (1995) observed that psychopathic individuals tend to make favourable initial impressions but with prolonged interaction their manipulative and deceitful nature becomes evident to others around them. The same has been suggested of Machiavellians (Wilson et al., 1996). The results from the present research, however, were only partially consistent with these observations and hypotheses. While higher scores on the psychopathy/Machiavellianism measures were significantly related to higher rates of lying in the last trial but not the first trial of the Exposure Condition for the Mach-IV and LSRP but not the PPI-R, direct comparisons

between the correlations for trial 1 and 10 were significant for the Mach-IV but not the LSRP. As well, while higher scores on the psychopathy/Machiavellianism measures were significantly related to a greater degree of lying in the last trial but not the first trial of the Exposure Condition for all three measures, direct comparisons between the correlations for trial 1 and 10 were significant for both the Mach-IV and LSRP but not for the PPI-R. Nevertheless, these findings suggest that lying frequency and severity in individuals who are higher on psychopathic tendencies may be influenced by the nature of the interaction (i.e., face-to-face vs. blind/anonymous; short vs. long) and the likelihood of facing negative repercussions. Additionally, results revealed that none of the correlations between the measure totals and the first and last trials were significant for the Non-Exposure Condition (nor were the differences between the correlations), possibly for the same reasons proposed above (see previous section).

Given the myriad recent examples in the media of prominent, high-functioning individuals in the business world who have defrauded others out of billions of dollars over many decades (e.g., Bernie Madoff), the length of an interaction is an important variable of study in the context of lying behaviour. While the present study employed a repeated game to assess lying behaviour over time in order to provide participants with ample opportunities to lie, it did not examine lying frequency and severity over a single interaction. Thus, the results from these two situations could not be compared. Future research should examine the lying behaviour of Machiavellians/psychopathic individuals over both single and repeated interactions in order to allow for direct comparisons between the two situations.

Similarly, Burks, Carpenter, and Verhoogen (2003) found that trust and reciprocity were reduced in single (as opposed to repeated), anonymous (as opposed to face-to-face) Trust Games when participants played both roles (i.e., P1s offered less money and P2s were less likely to split the tripled amount) relative to when participants played only one role. The authors suggested that participants may have been more inclined to act in a self-interested manner in the former relative to the latter situation, as they recognized that their counterparts would have multiple opportunities to recuperate losses on subsequent rounds with a different opponent. Thus, they had a sense of "reduced responsibility" (Burks et al., 2003, p. 196). While it has been suggested that psychopathic/Machiavellian individuals generally act in a self-interested manner and possess a competitive and exploitative worldview (Blackburn, 2006), it is unknown how playing both roles in the present study would affect lying frequency and severity in more

psychopathic/Machiavellian compared to less psychopathic/Machiavellian individuals. Thus, future studies should directly compare situations where participants play only one role to situations where participants play both roles.

Sex Differences

Consistent with previous findings, the results of the present research suggested that males were more Machiavellian and psychopathic than females. However, males and females varied somewhat on which aspects of psychopathy (i.e., which subscale measures) were significantly related to lying frequency and severity, though differences were not statistically significant (e.g., the Blame Externalization subscale was significantly related to Exposure Lying Frequency and Exposure Lying Severity for females but not for males). As well, males and females were not found to differ significantly on lying frequency or lying severity. These findings are in line with those of Aoki et al. (2010) who also did not find differences in lying frequency (lying severity was not investigated nor were psychopathic tendencies) between males and females in a different non-zero-sum game. Thus, while males in the study were found to be more Machiavellian and psychopathic than females, they did not significantly differ on lying frequency or severity. One possibility for the null findings in the present research may be that the small sample size used failed to detect the effect, which, in actuality, may also be of small magnitude. Another possibility for the lack of sex differences found may be that the iPod was differentially motivating for males compared to females. Perhaps if the prize consisted of a more stereotypically gender-biased item (e.g., Ultimate Fighting Championship tickets, etc), an emergence in sex differences on lying frequency and severity may have become apparent. Yet another possibility for these results may be that the males in the sample may not actually have been more Machiavellian or psychopathic than the females; rather, their higher scores may perhaps reflect a slightly exaggerated sense of bravado.

Self-Perceived Lying Behaviour

Results from the Post-Experiment Questionnaire – Part 2, which included questions derived from Klaver et al. (2007), revealed that certain characteristics of self-perceived lying behaviour were significantly related to higher scores on the psychopathy and Machiavellianism measures. Specifically, individuals scoring higher on psychopathic/Machiavellian tendencies were significantly more likely to perceive themselves as better liars compared to others and to report higher rates of lying over the course of a week. Higher scores on the

psychopathy/Machiavellianism measures were also significantly related to a higher tendency to report feeling excited and a lower tendency to report feeling guilty after deceiving another person. These findings are consistent with clinical accounts of psychopathic individuals as grandiose, callous/lacking in empathy, lacking in remorse or guilt, and having a propensity to lie and deceive (i.e., pathological lying), and further deriving enjoyment from such behaviours (also known as "duping delight;" Ekman, 2009). The latter may also explain why participants who scored higher on psychopathic/Machiavellian tendencies lied more frequently and to a greater degree than those who scored lower in the Exposure but not in the Non-Exposure Condition. That is, perhaps high scorers lied more frequently and severely in the Exposure but not in the Non-Exposure Condition than low scorers because they found it more thrilling or obtained more of a "rush" from knowing or seeing who it was they were deceiving.

Klaver et al (2007) also found that higher psychopathy scores were related to higher self-perceived lying ability. However, in contrast to the present research, they did not find higher psychopathy scores to be related to higher self-perceived lying frequency. While the researchers found that psychopathic offenders reported feeling less nervous or anxious after successful deception compared to their nonpsychopathic counterparts, they also found that no psychopathic offenders reported feeling "excited" and that there were no differences between psychopathic and nonpsychopathic offenders in their reporting of feeling "guilty" after successful deception. The differences in findings between the present research and that of Klaver et al. (2007) may have been due to dissimilarities in methodology between the two studies including the use of different lying tasks (non-zero-sum game versus telling truthful and falsified accounts of previous offenses), different samples (student versus offenders), and different measures of psychopathy (LSRP and PPI-R versus the PCL-R).

In the present research, self-reported lying behaviour was not found to be related to lying behaviour in the game, with the exception of feeling "guilty" after successful deception, which was negatively related to lying frequency and severity in the Exposure Condition (i.e., individuals who were more likely to report feeling "guilty" after successful deception were less likely to lie and to lie to a lesser degree when they had seen and interacted with their opponent prior to playing the game). These results are consistent with the "attitude-behaviour gap" (i.e., that there is a discrepancy between what people say they do or would do and what they actually do) often observed when general attitudes/intentions are measured and used to predict specific

behaviours (Ajzen & Fishbein, 2005). The reason for the discrepancy is because the relationship is influenced by individual differences and situational context (Azjen & Fishbein, 2005). In the case of the present research, two individuals may both report lying "often," but one may lie in the Lying Game while the other may not due to a variety of reasons (e.g., one may have wanted to win the "iPod" and thus lied more frequently in the game while the other may not have found the iPod to have been a sufficiently motivating incentive to warrant lying. Or one may have been more psychopathic than the other and derived enjoyment from lying while the other may not have, etc.).

Limitations and Future Directions

There are several limitations to the present research. First, the sample size was relatively small and consisted of a disproportionately higher number of females compared to males, thus reducing the generalizability of the results and the statistical power to detect significant effects, particularly with respect to the examination of sex differences. Second, the present research used undergraduate students, mostly from Introductory Psychology classes, and not offenders or psychiatric patients, who typically evidence a higher prevalence of clinical levels of psychopathy. However, the results of the present study are theoretically consistent with clinical descriptions of psychopathy and particularly with those involving the "successful" and "white-collar" subtype of the disorder (i.e., individuals who lie in a business or employment context in order to secure financial or material gain). Thus, in this regard, one could argue that it may be more appropriate to use a nonforensic sample rather than a forensic one. Third, most participants received course credit simply for presenting at the laboratory at the scheduled time for the study and thus may not have been sufficiently motivated to play the game or complete the questionnaires in an attentive manner. However, the inclusion of the draw to increase participant motivation and elicit thoughtful participation in the game, as well as the removal of participant data based on inconsistent responding on the self-report measures was expected to diminish the effects of possible participant indifference on the results.

Fourth, participants in the present research observed and were introduced to their "opponents" in the Exposure Condition via webcam rather than in the actual physical presence of one another due to practical reasons (i.e., to circumvent difficulties in recruiting a sufficient number of confederates). This served to increase experimental control by disallowing participants and opponents/confederates the opportunity to engage in a back-and-forth dialogue.

However, it simultaneously reduced external validity. Thus, researchers conducting comparable studies in the future may wish to consider examining the nature of the face-to-face interaction in a different way (e.g., allowing participants to meet in-person; allowing for varying durations of verbal exchanges, etc.).

The above limitations notwithstanding, the findings of the present research have made a valuable contribution to the study of lying behaviour in individuals with psychopathic tendencies. In particular, they have provided an initial empirical basis for the widespread clinical observation that individuals who are higher on psychopathic tendencies exhibit a higher propensity towards engagement in lying behaviour and are more likely to derive enjoyment from such behaviour compared to individuals who are lower on such tendencies. They have also provided a more nuanced understanding of the nature of lying behaviour in individuals with psychopathic individuals than is generally depicted in clinical writings. That is, the present findings suggest that individuals with psychopathic tendencies may not lie as indiscriminately as generally perceived, but rather their rate and degree of lying may be influenced by the nature of the interaction (i.e., face-to-face vs. blind/anonymous; short vs. long). Given that psychopathic individuals are also purported to be masterful liars in the clinical literature, empirically supported knowledge about lying frequency in this population is vital to enhancing the accuracy of lie detection, which is of notable importance within forensic and clinical contexts where matters of public safety are of primary concern.

Specifically, as previously suggested, the results of the present study are particularly germane to the context of white-collar/corporate crime and our understanding of its nature and process. Such understanding seems especially relevant and invaluable in the midst of the numerous recent high profile business scandals (e.g., Enron) that have been visible in the media and further, projections that corporate crime may be on the rise (Boe, 2010). Moreover, the present results are pertinent to augmenting our understanding of the lying behaviour of the "successful" or "subclinical" psychopath, who may not engage in behaviours that are illegal per se but rather in those that may still cause harm because they violate social norms or the rights of others (e.g., academic misconduct, sexual infidelity, etc). A major criticism of the current state of the psychopathy literature is that it has focused primarily on the criminal psychopath despite suggestions and clinical observations that psychopathy does not necessarily lead to serious antisocial behaviour or criminal deviance (Cleckley, 1976; Hall & Benning, 2006). Thus, as

aforementioned, future research should continue to explore the base rate of lying in individuals who are higher on psychopathic tendencies not only in clinical and forensic samples but also in subclinical and nonforensic samples, as the present investigation and others (e.g., Billings, 2004) have found personality profiles and patterns of lying behaviour in the latter that are consistent with that of clinical descriptions of the disorder. Additionally, nonforensic samples will likely be associated with a more heterogeneous spectrum of demographics, compared to offender samples, which tend to contain a high prevalence of individuals with cognitive and learning disabilities and are typically from low socioeconomic backgrounds (Jakobwitz & Egan, 2006; Samuelsson, Herkner, & Lundberg, 2009). Thus, employing such samples in future research would contribute to a more comprehensive understanding of the disorder overall.

In addition to the above, much research is still needed to discern the factors that affect the base rate and the severity of lying in individuals with psychopathic tendencies, such as the nature of the interaction (e.g., face-to-face versus blind/anonymous; short versus long) and the characteristics of the target/victim/lie detector (e.g., appearing overly trusting), as the present findings have suggested. Other factors in this category should include further exploration of sex differences and cultural differences. While the latter was not investigated in the present research, culture has been noted to play an important role in the manifestation of and one's motivation to engage in lying behaviour (Aune & Waters, 2002; Vrij & Winkel, 1991), as well as in the prevalence of psychopathy itself (Sullivan & Kosson, 2006). Thus, it merits considerable empirical attention. Moreover, as aforementioned, future research should focus on which aspects of psychopathy (i.e., interpersonal versus behavioural) are better associated with lying frequency and lying severity, and accordingly which measures best predict such behaviours, as the present findings have suggested differences across both. In pursuing these research questions, it has been shown in the present study that examination of lying conduct using non-zero-sum games can provide a meaningful analogue for and valuable insight into the complex nature of real-world lying behaviour.

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APPENDIX A: LSRP

Please read each statement and consider your level of agreement. Rate each statement using the following scale and record your answers by circling the answer under each statement that is most representative of how you feel.

0. Disagree Strongly – I disagree completely with this statement
1. Disagree Somewhat – I disagree with this statement but not entirely
2. Agree Somewhat– I agree with this statement but not entirely
3. Agree Strongly – I agree completely with this statement

1. Success is based on survival of the fittest; I am not concerned about the losers.
0----------1----------2----------3
disagree strongly disagree somewhat agree somewhat agree strongly

2. For me, what's right is whatever I can get away with.
0----------1----------2----------3
disagree strongly disagree somewhat agree somewhat agree strongly

3. In today's world, I feel justified in doing anything I can get away with to succeed.
0----------1----------2----------3
disagree strongly disagree somewhat agree somewhat agree strongly

4. My main purpose in life is getting as many goodies as I can.
0----------1----------2----------3
disagree strongly disagree somewhat agree somewhat agree strongly

5. Making a lot of money is my most important goal.
0----------1----------2----------3
disagree strongly disagree somewhat agree somewhat agree strongly

6. I let others worry about higher values; my main concern is with the bottom line.
0----------1----------2----------3
disagree strongly disagree somewhat agree somewhat agree strongly

7. People who are stupid enough to get ripped off usually deserve it.
0----------1----------2----------3
disagree strongly disagree somewhat agree somewhat agree strongly

8. Looking out for myself is my top priority.
0----------1----------2----------3
disagree strongly disagree somewhat agree somewhat agree strongly

9. I tell other people what they want to hear so that they will do what I want them to do.
0----------1----------2----------3
disagree strongly disagree somewhat agree somewhat agree strongly

10. I would be upset if my success came at someone else's expense.
0----------1----------2----------3
disagree strongly disagree somewhat agree somewhat agree strongly

11. I often admire a really clever scam.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

12. I make a point of trying not to hurt others in pursuit of my goals.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

13.1 enjoy manipulating other people's feelings.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

14. I feel bad if my words or actions cause someone else to feel emotional pain.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

15. Even if I were trying very hard to sell something, I wouldn't lie about it.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

16. Cheating is not justified because it is unfair to others.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

17. I find myself in the same kinds of trouble, time after time.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

18. I am often bored.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

19. I find that I am able to pursue one goal for a long time.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

20. I don't plan anything very far in advance.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

21. I quickly lose interest in tasks I start.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

22. Most of my problems are due to the fact that other people just don't understand me.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

23. Before I do anything, I carefully consider the possible consequences.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

24. I have been in a lot of shouting matches with other people.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

25. When I get frustrated, I often "let off steam" by blowing my top.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

26. Love is overrated.

0----------1----------2----------3

disagree strongly disagree somewhat agree somewhat agree strongly

APPENDIX B: MACH-IV SCALE

Below are twenty statements**.** Please read each one and consider your level of agreement. Rate each statement using the following scale and record your answers by circling the answer under each statement that is most representative of how you feel.

1. Strongly Agree – I agree completely with this statement
2. Somewhat Agree – I agree with this statement but not entirely
3. No Opinion – I have no opinion about this statement
4. Somewhat Disagree – I disagree with this statement but not entirely
5. Strongly Disagree – I disagree completely with this statement

1) The best way to handle people is to tell them what they want to hear.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

2) When you ask someone to do something for you, it is best to give the real reasons for wanting it rather than giving reasons which might carry more weight.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

3) Anyone who completely trusts anyone else is asking for trouble.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

4) It is hard to get ahead without cutting corners here and there.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

5) Honesty is the best policy in all cases.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

6) It's safe to assume that all people have a vicious streak that will come out when they are given a chance.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

7) Never tell anyone the real reason you did something unless it is useful to do so.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

8) One should take action only when sure it is morally right.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

9) It is wise to flatter important people.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

10) All in all, it is better to be humble and honest than important and dishonest.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

11) Barnum was very wrong when he said there's a sucker born every minute.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

12) People suffering from incurable diseases should have the choice of being put painlessly to death.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

13) It is possible to be good in all respects.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

14) Most people are basically good and kind.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

15) There is no excuse for lying to someone else.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

16) Most people forget more easily the death of their parent than the loss of their property.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

17) Most people who get ahead in the world lead clean, moral lives.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

18) Generally speaking, people won't work hard unless they are forced to do so.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

19) The biggest difference between most criminals and other people is that criminals are stupid enough to get caught.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

20) Most people are brave.
1. Strongly Agree **2.** Somewhat Agree **3.** No Opinion **4.** Somewhat Disagree **5.** Strongly Disagree

APPENDIX C: POST-EXPERIMENT QUESTIONNAIRE – PART 1 (PILOT TESTING)

1. In the **first** 10 computer trials, you were Player 1 ____ Player 2 ____ (check one).

2. In a sentence or two, please state your view of what is being investigated in this study.

_____
_____
_____
_____
_____
_____

3. Did you know any of the other participants in the waiting room prior to today's experiment?

Yes____ No_____ (check one)

If so, who? _____

4. (a) During the **first** 10 computer trials, were you able to deduce any characteristics about the other participant? Please describe in a sentence or two.

_____
_____
_____
_____
_____
_____

(b) During the **second** 10 computer trials, were you able to deduce any characteristics about the other participant? Please describe in a sentence or two.

_____
_____
_____
_____
_____
_____

Participant Information:

5. Age: ____

6. Gender: M___ F___ (check one)

APPENDIX D - POST-EXPERIMENT QUESTIONNAIRE – PART 2 (PILOT TESTING)

1. Please circle the number that best describes your response to the following question:
Compared to others, how good are you at lying?

1----------2----------3----------4----------5

Very Much Below Average	Below Average	Average	Above Average	Very Much Above Average

2. How do you generally feel when you know that you have successfully deceived another person?
Check all that apply:
(a) excited
(b) nervous/anxious
(c) scared/worried
(d) guilty
(e) other (please specify): _____

3. In general, how often do you lie in a week?

1----------2----------3----------4----------5

Never	Rarely	Sometimes	Often	Very Often

4. Is your response to question 3 one of those times that you lie?

_____
_____
_____
_____
_____
_____

APPENDIX E: CONSENT FORM (PILOT TESTING)

You are invited to participate in a research project entitled The Effect of Gender and Personality on Individual Judgement and Decision-Making. Please read this form carefully, and feel free to ask questions you might have.

Researcher(s):
Student Researcher: Kate Pan, Ph.D. Student, Department of Psychology, Arts Building, Room 69A, University of Saskatchewan. Phone: (306) 966-6719. Email: kate.pan@usask.ca

Researcher Supervisor: J. Stephen Wormith, Ph.D., Department of Psychology, Arts Building, Room 180, University of Saskatchewan. Phone: (306) 966-6818. Email: s.wormith@usask.ca

Purpose and Procedure: The purpose of this study is to examine the influence of gender and personality on individual judgement and decision-making. Participation in this study is voluntary and consists of playing a series of computer game trials and completing several personality measures. The study is expected to take between 45 to 60 minutes to complete. You will receive two research credits for your participation, as well as the opportunity to enter into a draw for an 8GB iPod Music Player. The findings from this study will be written up in the form of a Doctoral thesis. It is also anticipated that the findings from this study will be presented at academic conferences and submitted for publication to a peer-reviewed scientific journal. All data collected will be reported in aggregate or summarized form, thus your identity will be kept confidential.

Potential Benefits: While there are no direct benefits for participating beyond learning about the process of psychological research, your participation in this study will assist researchers in their effort to better understand the influence of gender and personality on individual judgement and decision-making behaviour.

Potential Risks: There are no physical or mental health risks associated with participating in the study. However, some of the measures are designed to examine aspects of your personality, behaviour, and how you view the world in general. While the measures are not designed to make you feel uncomfortable, they may cause some personal embarrassment as you answer the questions. Thus, you are free to answer only those questions that you feel comfortable answering and you may withdraw from the study at any time without penalty by verbally informing the researcher. Further, you may request that your data be removed from the data set at any time, which will also result in the immediate destruction of the data that you have contributed. If you do experience any stress, or have concerns or questions at any time throughout the data collection period and/or after you finish participating, you are encouraged to discuss them with the student researcher or her researcher supervisor. Please contact the researchers using the information provided above. Alternatively, you may decide to contact Student Counseling Services (306-966-4920).

Storage of Data: The data collected today will be kept in secure location in a locked filing cabinet Dr. J. Stephen Wormith's research lab for a minimum of five years, after which the data will be destroyed beyond recovery.

Confidentiality: All information collected is entirely confidential. Please do not put your name on the measures and questionnaires. Confidentiality will be maintained by identifying questionnaire data using only a numerical identification code generated by the researcher, so that no one will be able to connect your name to your responses. Computerized data will similarly be identified by the same numerical identification code, stored on a password-protected computer until such time that it can be burned onto a CD, deleted from the computer, and stored in a locked filing cabinet, separate from the consent forms. Further, only aggregate data will be included in the final reporting of the results, any personal or identifying information will not be included. Additionally, you should be aware that the researcher will be obligated to report any intent to harm one's self or another person to the authorities (e.g., if you tell the researcher that you plan on finding John Doe and verbally or physically assaulting him).

Right to Withdraw: Your participation is voluntary, and you can answer only those questions that you are comfortable with. There is no guarantee that you will personally benefit from your involvement. The information that is shared will be held in strict confidence and discussed only with the research team. You may withdraw from the research project for any reason, at any time, without penalty of any sort. If you choose to withdraw from the study you will still receive the research credits and the opportunity to participate in the draw associated with participating in this study. If you withdraw from the research project at any time, any data that you have contributed will be destroyed at your request.

Questions: If you have any questions concerning the research project, please feel free to ask at any point; you are also free to contact the researchers at the numbers provided if you have other questions. This research project has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board on April 14, 2009. Any questions regarding your rights as a participant may be addressed to that committee through the Ethics Office (966-2084). Out of town participants may call collect.

Follow-Up or Debriefing: You will be provided with a debriefing sheet at the end of the experiment, or in the event that you choose not to participate. The debriefing sheet will provide some background to the study and specify the aims of the study. Information concerning the results of the study may be arranged (following the study's completion) via Kate Pan or Dr. Wormith at the contact address above.

Consent to Participate: I have read and understood the description provided; I have had an opportunity to ask questions and my questions have been answered. I consent to participate in the research project, understanding that I may withdraw my consent at any time. A copy of this Consent Form has been given to me for my records.

_____	_____
(Name of Participant)	(Date)
_____	_____
(Signature of Participant)	(Signature of Researcher)

APPENDIX F: INSTRUCTIONS FOR MODIFIED $10 TRUST GAME – CONDITION 1

Instructions for Player1

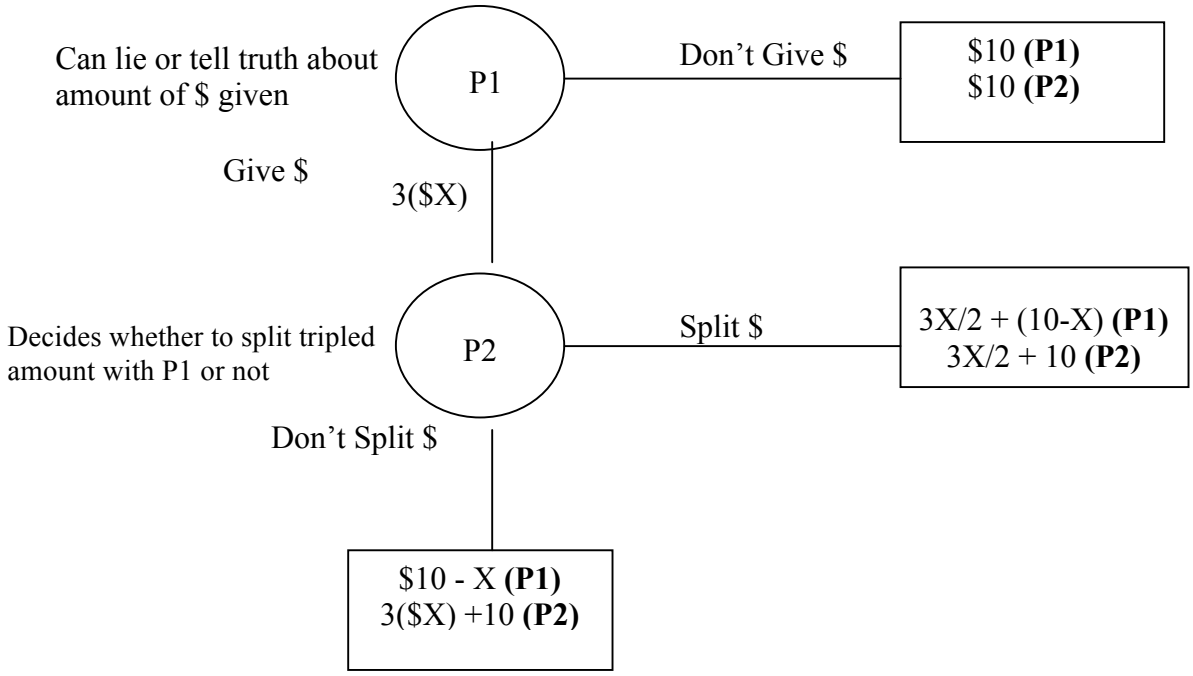
You have been asked to participate in a psychology experiment. You will be playing a series of games on a computer. Please read these instructions carefully and ask any questions prior to the start of the experiment, as the researcher may not be available once the game has begun.

You have been designated to be Player 1 in this experiment. You will be paired with another participant who will be designated as Player 2. At no point before, during, or after the experiment will you be told who the other participant is.

You will be playing a game wherein you and the other player are each given $10 of virtual money. As Player 1 (P1), you can give Player 2 (P2) any dollar amount between $0 and $10; any amount you give to P2 will triple for him/her. P2 can then decide to either split this tripled amount with you or keep it all to him- or herself. Please note: you do not have to give P2 the amount that you said you would; you can give him/her more or less. P2 will base his/her decision on what you have told him/her; s/he will not know what you have actually given him/her until after s/he has made his decision to split the money with you or not.

As you can see on the computer monitor, you have been given $10 in virtual money to begin (Player 2's screen will also display $10 in virtual money to start). To begin, you will have the opportunity to give any dollar amount between $1 and $10 of your virtual money to Player 2 (see diagram below) or you may decide not to give any money at all, in which case the game ends and you both end up with the $10 you began with. However, if you do give money to Player 2, each dollar you give will be tripled. For example, if you give $2, it will triple to become $6. Player 2 will decide whether or not s/he will split this tripled amount evenly with you. If s/he decides to split the money evenly with you, for example if the tripled amount is $6, you will end up with $11 (i.e., $3 + what remains of your original $10, which is $8) and s/he will end up with $13 (i.e., $3 + his/her original $10).

As noted above, you do not have to give P2 the amount you said you would; you can give him/her more or less. The amount that you are telling P2 that you are giving will be entered into the "disclosed amount" box on the computer screen. You will notice that there is also a box for the "actual amount." This is the amount of money that you actually want to give to P2. To clarify, both the "disclosed amount" and "actual amount" can be the same or different (i.e., more or less). Player 2 will decide whether to split or not split any money with you based only on the "disclosed amount" you enter. S/He will not see the "actual amount" you enter until after s/he has made this decision.



Once Player 2 makes his/her decision, the trial ends. You will play this game with Player 2 10 times. The computer will tally up your earnings and this will be displayed in the top portion of your screen at the end of all 10 games. Each dollar amount you earn will be equivalent to one entry into a draw for an iPod music player (e.g., if you earn $10, your name will be entered into the draw 10 times).

When you have finished playing the 10 games, please notify the researcher.

APPENDIX G: INSTRUCTIONS FOR MODIFIED $10 TRUST GAME – CONDITION 1

Instructions for Player2

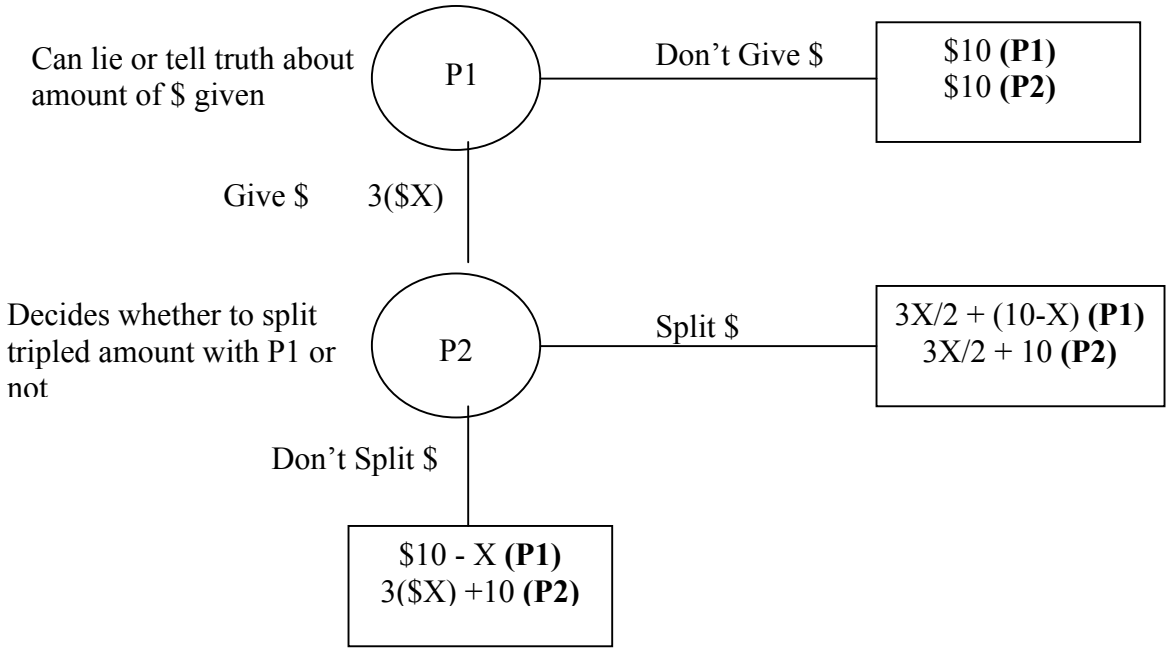
You have been asked to participate in a psychology experiment. You will be playing a series of games on a computer. Please read these instructions carefully and ask any questions prior to the start of the experiment, as the researcher may not be available once the game has begun.

You have been designated to be Player 2 in this experiment. You will be paired with another participant who will be designated as Player 1. At no point before, during, or after the experiment will you be told who the other participant is.

You will be playing a game wherein you and the other player are each given $10 of virtual money. Player 1 (P1) can give you as Player 2 (P2) any dollar amount between $0 and $10; any amount s/he gives to you will triple. You can decide to either split this tripled amount with him/her or keep it all to yourself. Please note: P1 does not have to give you the amount that s/he said s/he would; s/he can give you more or less. You will base your decision on what s/he has told you; you will not know what s/he has actually given you until after you have made your decision to split the money with him/her or not.

As you can see on the computer monitor, you have been given $10 in virtual money to begin (Player 1's screen will also display $10 in virtual money to start). To begin, P1 will have the opportunity to give any dollar amount between $1 and $10 of his/her virtual money to you (see diagram below) or s/he may decide not to give any money at all, in which case the game ends and you both end up with the $10 you began with. However, if s/he does give money to you, each dollar s/he gives will be tripled. For example, if s/he gives $2, it will triple to become $6. You will decide whether or not you will split this tripled amount evenly with him/her. If you decide to split the money evenly with him/her, for example if the tripled amount is $6, s/he will end up with $11 (i.e., $3 + what remains of his/her original $10, which is $8) and you will end up with $13 (i.e., $3 + your original $10).

As noted above, P1 does not have to give you the amount s/he said s/he would; s/he can give you more or less. The amount that s/he tells you that s/he is giving will be entered into the "disclosed amount" box on the computer screen. There is also a box for the "actual amount" on P1's screen. This is the amount of money that s/he actually wants to give to you. To clarify, both the "disclosed amount" and the "actual amount" can be the same or different (i.e., more or less). You will decide whether to split or not split any money with P1 based only on the "disclosed amount" s/he enters. You will not see the "actual amount" s/he enters until after you have made this decision.



Once you make your decision, the trial ends. You will play this game with Player 1 10 times. The computer will tally up your earnings and this will be displayed in the top portion of your screen at the end of all 10 games. Each dollar amount you earn will be equivalent to one entry into a draw for an iPod music player (e.g., if you earn $10, your name will be entered into the draw 10 times).

When you have finished playing the 10 games, please notify the researcher.

APPENDIX H: RESEARCHER'S SCRIPT (CONDITION 1 PRECEDES CONDITION 2) PILOT TESTING

At the end of Condition 1

R(eseacher): Ok, participant's name, now I have to go check on the other participants in the experiment. I'm going to bring you to a waiting room for a bit while I get organized and set up for the next part of the study.

(Arriving at the waiting room, where the three confederates are already waiting)

R: Participant's name, this is _____ (confederate 1).

Confederate 1: Hi

R: this is _____ (confederate 2).

Confederate 2: Hi

R: and this is _____ (confederate 3)

Confederate 3: Hi

R: Participant's name, you are going to be playing _____ (confederate 1) in the first game, where you'll be Player 1 and s/he'll be Player 2. Then, in the second game, you'll play _____ (confederate 2). In that game, s/he'll be Player 1 and you'll be Player 2.

Alright, I'm going to leave you now to check up on the others and set up the computers. I will be back in a few minutes to get you two (i.e., participant and confederate 1) set up first.

APPENDIX I: INSTRUCTIONS FOR MODIFIED $10 TRUST GAME – CONDITION 2

Instructions for Player1

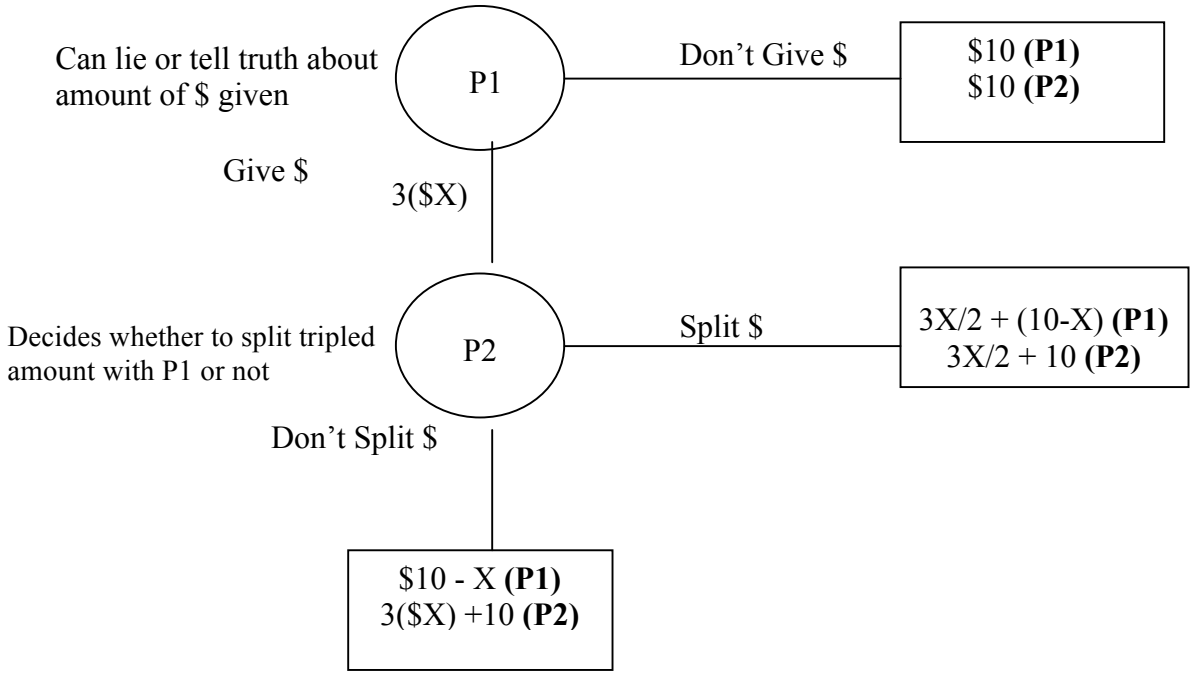
You have been asked to participate in a psychology experiment. You will be playing a series of games on a computer. Please read these instructions carefully and ask any questions prior to the start of the experiment, as the researcher may not be available once the game has begun.

You have been designated to be Player 1 in this experiment. You will be paired with another participant who has been designated as Player 2.

You will be playing a game wherein you and the other player are each given $10 of virtual money. As Player 1 (P1), you can give Player 2 (P2) any dollar amount between $0 and $10; any amount you give to P2 will triple for him/her. P2 can then decide to either split this tripled amount with you or keep it all to him- or herself. Please note: you do not have to give P2 the amount that you said you would; you can give him/her more or less. P2 will base his/her decision on what you have told him/her; s/he will not know what you have actually given him/her until after s/he has made his decision to split the money with you or not.

As you can see on the computer monitor, you have been given $10 in virtual money to begin (Player 2's screen will also display $10 in virtual money to start). To begin, you will have the opportunity to give any dollar amount between $1 and $10 of your virtual money to Player 2 (see diagram below) or you may decide not to give any money at all, in which case the game ends and you both end up with the $10 you began with. However, if you do give money to Player 2, each dollar you give will be tripled. For example, if you give $2, it will triple to become $6. Player 2 will decide whether or not s/he will split this tripled amount evenly with you. If s/he decides to split the money evenly with you, for example if the tripled amount is $6, you will end up with $11 (i.e., $3 + what remains of your original $10, which is $8) and s/he will end up with $13 (i.e., $3 + his/her original $10).

As noted above, you do not have to give P2 the amount you said you would; you can give him/her more or less. The amount that you are telling P2 that you are giving will be entered into the "disclosed amount" box on the computer screen. You will notice that there is also a box for the "actual amount." This is the amount of money that you actually want to give to P2. To clarify, both the "disclosed amount" and "actual amount" can be the same or different (i.e., more or less). Player 2 will decide whether to split or not split any money with you based only on the "disclosed amount" you enter. S/He will not see the "actual amount" you enter until after s/he has made this decision.



Once Player 2 makes his/her decision, the trial ends. You will play this game with Player 2 10 times. The computer will tally up your earnings and this will be displayed in the top portion of your screen at the end of all 10 games. Each dollar amount you earn will be equivalent to one entry into a draw for an iPod music player (e.g., if you earn $10, your name will be entered into the draw 10 times).

When you have finished playing the 10 games, please notify the researcher.

APPENDIX J: RESEARCHER'S SCRIPT (CONDITION 2 PRECEDES CONDITION 1) PILOT TESTING

After providing participants with the instructions to the game and prior to beginning the $10 Trust Game

R(esearcher): Ok, participant's name, now I have to go check on the other participants in the experiment. I'm going to bring you to a waiting room for a bit while I get organized and set up the study.

(Arriving at the waiting room, where the three confederates are already waiting)

R: Participant's name, this is _____ (confederate 1).

Confederate 1: Hi

R: this is _____ (confederate 2).

Confederate 2: Hi

E: and this is _____ (confederate 3)

Confederate 3: Hi

R: Participant's name, you are going to be playing _____ (confederate 1) in the first game, where you'll be Player 1 and s/he'll be Player 2. Then, in the second game, you'll play _____ (confederate 2). In that game, s/he'll be Player 1 and you'll be Player 2.

Alright, I'm going to leave you now to check up on the others and set up the computers. I will be back in a few minutes to get you two (i.e., participant and confederate 1) set up first.

APPENDIX K: INSTRUCTIONS FOR MODIFIED $10 TRUST GAME – CONDITION 2

Instructions for Player2

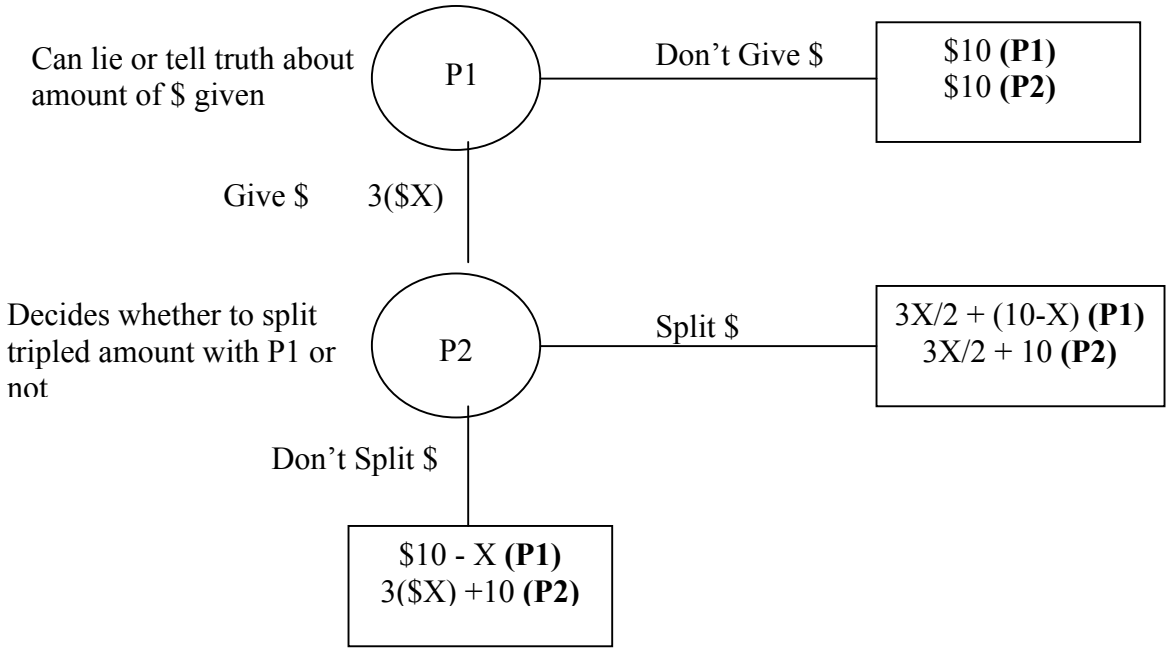
You have been asked to participate in a psychology experiment. You will be playing a series of games on a computer. Please read these instructions carefully and ask any questions prior to the start of the experiment, as the researcher may not be available once the game has begun.

You have been designated to be Player 2 in this experiment. You will be paired with another participant who has been designated as Player 1.

You will be playing a game wherein you and the other player are each given $10 of virtual money. Player 1 (P1) can give you as Player 2 (P2) any dollar amount between $0 and $10; any amount s/he gives to you will triple. You can decide to either split this tripled amount with him/her or keep it all to yourself. Please note: P1 does not have to give you the amount that s/he said s/he would; s/he can give you more or less. You will base your decision on what s/he has told you; you will not know what s/he has actually given you until after you have made your decision to split the money with him/her or not.

As you can see on the computer monitor, you have been given $10 in virtual money to begin (Player 1's screen will also display $10 in virtual money to start). To begin, P1 will have the opportunity to give any dollar amount between $1 and $10 of his/her virtual money to you (see diagram below) or s/he may decide not to give any money at all, in which case the game ends and you both end up with the $10 you began with. However, if s/he does give money to you, each dollar s/he gives will be tripled. For example, if s/he gives $2, it will triple to become $6. You will decide whether or not you will split this tripled amount evenly with him/her. If you decide to split the money evenly with him/her, for example if the tripled amount is $6, s/he will end up with $11 (i.e., $3 + what remains of his/her original $10, which is $8) and you will end up with $13 (i.e., $3 + your original $10).

As noted above, P1 does not have to give you the amount s/he said s/he would; s/he can give you more or less. The amount that s/he tells you that s/he is giving will be entered into the "disclosed amount" box on the computer screen. There is also a box for the "actual amount" on P1's screen. This is the amount of money that s/he actually wants to give to you. To clarify, both the "disclosed amount" and the "actual amount" can be the same or different (i.e., more or less). You will decide whether to split or not split any money with P1 based only on the "disclosed amount" s/he enters. You will not see the "actual amount" s/he enters until after you have made this decision.



Once you make your decision, the trial ends. You will play this game with Player 1 10 times. The computer will tally up your earnings and this will be displayed in the top portion of your screen at the end of all 10 games. Each dollar amount you earn will be equivalent to one entry into a draw for an iPod music player (e.g., if you earn $10, your name will be entered into the draw 10 times).

When you have finished playing the 10 games, please notify the researcher.

APPENDIX L: DEBRIEFING FORM

We are interested in examining the relationships between lying and gender, and between lying and certain personality traits/dimensions, such as, degree of emotional involvement when interacting with others, ambitiousness, and competitiveness. Specifically, we are interested in whether gender and certain personality traits are associated with the tendency to favour the use of lying in interpersonal interactions. Although there is a growing literature on lie detection and nonverbal indicators of lying, there is a paucity of research examining the effect of gender and specific personality styles on the use of lying.

We want to thank you for your participation in this study. You have provided us with much valuable information. We hope that with your participation we will gain a deeper understanding into the nature of lying behaviour.

If you would like to receive a summary of the results for this study, please contact Kate Pan at kate.pan@usask.ca or (306) 966-6719 or Dr. J. Stephen Wormith at s.wormith@usask.ca or (306) 966-6818. If participation in this study raises any emotional and/or psychological concerns for you, you are encouraged to contact Student Counselling Services at (306-966-4920).

There are two final points we would like to mention. First, your responses will remain absolutely confidential. Your data is identified only by a numerical identification code generated by the researcher, so no one will be able to connect your name to your responses. Second, we ask that you not tell others about the details of this study. The reason for this is that if potential participants knew what this study is about, this information will influence their responses, and we would obtain misleading information from them. Therefore, it is important that you do not talk about this study to your friends or to other people who may be in the experiment in the future, or allow them to read this debriefing sheet. Please also do not tell others who may have contact with potential participants. Thank you very much.

Consent to Use Data: I have read and understood the description provided; I have had an opportunity to ask questions and my questions have been answered. I understand that participation is voluntary and that I can decline consent without penalty of any sort. A copy of this form has been given to me for my records.

☐ I consent to the researchers using the data that I have contributed.

☐ I do not consent to the researchers using the data that I have contributed.

_____ _____

(Name of Participant) (Date)

_____ _____

(Signature of Participant) (Signature of Researcher)

APPENDIX M: POST-EXPERIMENT QUESTIONNAIRE – PART 1 (MAIN STUDY)

1. In a sentence or two, please state your view of what is being investigated in this study.

_____
_____
_____
_____
_____
_____

2. Did you know any of the other participants prior to today's experiment?

Yes____ No_____ (check one)

If so, who? _____

3. (a) Were you able to deduce any characteristics about the participant in the **first** video clip? Please describe in a sentence or two.

_____
_____
_____
_____
_____
_____

(b) Were you able to deduce any characteristics about the participant in the **second** video clip? Please describe in a sentence or two.

_____
_____
_____
_____
_____
_____

Participant Information:
4. Age: ____

5. Gender: M___ F___ (check one)

6. Ethnicity (please check all that apply):

Aboriginal ____ Asian ____ Black/African ____ Hispanic or Latino ____

White (Caucasian) ____ Other (please specify) _____

7. Year of university study: 1st ___ 2nd ___ 3rd ___ 4th ___ 5th +___

8. Major area of study (e.g., Arts and Science, Business, etc): _____

APPENDIX N: CONSENT FORM FOR PARTICIPANTS FROM THE PSYCHOLOGY POOL

You are invited to participate in a research project entitled The Effect of Gender and Personality on Individual Judgement and Decision-Making. Please read this form carefully, and feel free to ask questions you might have.

Researcher(s):
Student Researcher: Kate Pan, Ph.D. Student, Department of Psychology, Arts Building, Room 69A, University of Saskatchewan. Phone: (306) 966-6719. Email: kate.pan@usask.ca

Researcher Supervisor: J. Stephen Wormith, Ph.D., Department of Psychology, Arts Building, Room 180, University of Saskatchewan. Phone: (306) 966-6818. Email: s.wormith@usask.ca

Purpose and Procedure: The purpose of this study is to examine the influence of gender and personality on individual judgement and decision-making. Participation in this study is voluntary and consists of playing a series of computer game trials, completing several personality measures, and recording a short video greeting. The study is expected to take between 45 to 60 minutes to complete. You will receive two research credits for your participation, as well as the opportunity to enter into a draw for an 8GB iPod Music Player. The findings from this study will be written up in the form of a Doctoral thesis. It is also anticipated that the findings from this study will be presented at academic conferences and submitted for publication to a peer-reviewed scientific journal. All data collected will be reported in aggregate or summarized form, thus your identity will be kept confidential.

Potential Benefits: While there are no direct benefits for participating beyond learning about the process of psychological research, your participation in this study will assist researchers in their effort to better understand the influence of gender and personality on individual judgement and decision-making behaviour.

Potential Risks: There are no physical or mental health risks associated with participating in the study. However, some of the measures are designed to examine aspects of your personality, behaviour, and how you view the world in general. While the measures are not designed to make you feel uncomfortable, they may cause some personal embarrassment as you answer the questions. Thus, you are free to answer only those questions that you feel comfortable answering and you may withdraw from the study at any time without penalty by verbally informing the researcher. Further, you may request that your data be removed from the data set at any time, which will also result in the immediate destruction of the data that you have contributed. If you do experience any stress, or have concerns or questions at any time throughout the data collection period and/or after you finish participating, you are encouraged to discuss them with the student researcher or her researcher supervisor. Please contact the researchers using the information provided above. Alternatively, you may decide to contact Student Counseling Services (306-966-4920).

Storage of Data: The data collected today will be kept in secure location in a locked filing cabinet Dr. J. Stephen Wormith's research lab for a minimum of five years, after which the data will be destroyed beyond recovery.

Confidentiality: All information collected is entirely confidential. Please do not put your name on the measures and questionnaires. Confidentiality will be maintained by identifying questionnaire data using only a numerical identification code generated by the researcher, so that no one will be able to connect your name to your responses. Computerized data (including the video greeting) will similarly be identified by the same numerical identification code, stored on a password-protected computer until such time that it can be burned onto a CD, deleted from the computer, and stored in a locked filing cabinet, separate from the consent forms. Further, only aggregate data will be included in the final reporting of the results, any personal or identifying information will not be included. Additionally, you should be aware that the researcher will be obligated to report any intent to harm one's self or another person to the authorities (e.g., if you tell the researcher that you plan on finding John Doe and verbally or physically assaulting him).

Right to Withdraw: Your participation is voluntary, and you can answer only those questions that you are comfortable with. There is no guarantee that you will personally benefit from your involvement. The information that is shared will be held in strict confidence and discussed only with the research team. You may withdraw from the research project for any reason, at any time, without penalty of any sort. If you choose to withdraw from the study you will still receive the research credits and the opportunity to participate in the draw associated with participating in this study. If you withdraw from the research project at any time, any data that you have contributed will be destroyed at your request.

Questions: If you have any questions concerning the research project, please feel free to ask at any point; you are also free to contact the researchers at the numbers provided if you have other questions. This research project has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board on August 4, 2010. Any questions regarding your rights as a participant may be addressed to that committee through the Ethics Office (966-2084). Out of town participants may call collect.

Follow-Up or Debriefing: You will be provided with a debriefing sheet at the end of the experiment, or in the event that you choose not to participate. The debriefing sheet will provide some background to the study and specify the aims of the study. Information concerning the results of the study may be arranged (following the study's completion) via Kate Pan or Dr. Wormith at the contact address above.

Consent to Participate: I have read and understood the description provided; I have had an opportunity to ask questions and my questions have been answered. I consent to participate in the research project, understanding that I may withdraw my consent at any time. A copy of this Consent Form has been given to me for my records.

_____	_____
(Name of Participant)	(Date)
_____	_____
(Signature of Participant)	(Signature of Researcher)

APPENDIX O: CONSENT FORM FOR MALES OUTSIDE OF THE PSYCHOLOGY POOL

You are invited to participate in a research project entitled The Effect of Gender and Personality on Individual Judgement and Decision-Making (S2). Please read this form carefully, and feel free to ask questions you might have.

Researcher(s):
Student Researcher: Kate Pan, Ph.D. Student, Department of Psychology, Arts Building, Room 69A, University of Saskatchewan. Phone: (306) 966-6719. Email: kate.pan@usask.ca

Researcher Supervisor: J. Stephen Wormith, Ph.D., Department of Psychology, Arts Building, Room 180, University of Saskatchewan. Phone: (306) 966-6818. Email: s.wormith@usask.ca

Purpose and Procedure: The purpose of this study is to examine the influence of gender and personality on individual judgement and decision-making. Participation in this study is voluntary and consists of playing a series of computer game trials, completing several personality measures, and recording a short video greeting. The study is expected to take approximately 60 minutes to complete. As part of your participation, you will receive the opportunity to enter into a draw to win an 8GB iPod Music Player **or** two regular season tickets to a Saskatchewan Roughriders game (the total value of the tickets will be of approximately the same value as the iPod Music Player. The findings from this study will be written up in the form of a Doctoral thesis. It is also anticipated that the findings from this study will be presented at academic conferences and submitted for publication to a peer-reviewed scientific journal. All data collected will be reported in aggregate or summarized form, thus your identity will be kept confidential.

Potential Benefits: While there are no direct benefits for participating beyond learning about the process of psychological research, your participation in this study will assist researchers in their effort to better understand the influence of gender and personality on individual judgement and decision-making behaviour.

Potential Risks: There are no physical or mental health risks associated with participating in the study. However, some of the measures are designed to examine aspects of your personality, behaviour, and how you view the world in general. While the measures are not designed to make you feel uncomfortable, they may cause some personal embarrassment as you answer the questions. Thus, you are free to answer only those questions that you feel comfortable answering and you may withdraw from the study at any time without penalty by verbally informing the researcher. Further, you may request that your data be removed from the data set at any time, which will also result in the immediate destruction of the data that you have contributed. If you do experience any stress, or have concerns or questions at any time throughout the data collection period and/or after you finish participating, you are encouraged to discuss them with the student researcher or her researcher supervisor. Please contact the researchers using the information provided above. Alternatively, you may decide to contact Student Counseling Services (306-966-4920).

Storage of Data: The data collected today will be kept in secure location in a locked filing cabinet Dr. J. Stephen Wormith's research lab for a minimum of five years, after which the data will be destroyed beyond recovery.

Confidentiality: All information collected is entirely confidential. Please do not put your name on the measures and questionnaires. Confidentiality will be maintained by identifying questionnaire data using only a numerical identification code generated by the researcher, so that no one will be able to connect your name to your responses. Computerized data (including the video greeting) will similarly be identified by the same numerical identification code, stored on a password-protected computer until such time that it can be burned onto a CD, deleted from the computer, and stored in a locked filing cabinet, separate from the consent forms. Further, only aggregate data will be included in the final reporting of the results, any personal or identifying information will not be included. Additionally, you should be aware that the researcher will be obligated to report any intent to harm one's self or another person to the authorities (e.g., if you tell the researcher that you plan on finding John Doe and verbally or physically assaulting him).

Right to Withdraw: Your participation is voluntary, and you can answer only those questions that you are comfortable with. There is no guarantee that you will personally benefit from your involvement. The information that is shared will be held in strict confidence and discussed only with the research team. You may withdraw from the research project for any reason, at any time, without penalty of any sort. If you choose to withdraw from the study you will still receive the research credits and the opportunity to participate in the draw associated with participating in this study. If you withdraw from the research project at any time, any data that you have contributed will be destroyed at your request.

Questions: If you have any questions concerning the research project, please feel free to ask at any point; you are also free to contact the researchers at the numbers provided if you have other questions. This research project has been approved on ethical grounds by the University of Saskatchewan Behavioural Research Ethics Board on August 4, 2010. Any questions regarding your rights as a participant may be addressed to that committee through the Ethics Office (966-2084). Out of town participants may call collect.

Follow-Up or Debriefing: You will be provided with a debriefing sheet at the end of the experiment, or in the event that you choose not to participate. The debriefing sheet will provide some background to the study and specify the aims of the study. Information concerning the results of the study may be arranged (following the study's completion) via Kate Pan or Dr. Wormith at the contact address above.

Consent to Participate: I have read and understood the description provided; I have had an opportunity to ask questions and my questions have been answered. I consent to participate in the research project, understanding that I may withdraw my consent at any time. A copy of this Consent Form has been given to me for my records.

_____	_____
(Name of Participant)	(Date)
_____	_____
(Signature of Participant)	(Signature of Researcher)

APPENDIX P: RESEARCHER'S SCRIPT (CONDITION 1 PRECEDES CONDITION 2) MAIN STUDY

R(eseacher): Ok, participant's name, to give you a sense of who you're playing next. I've got a video greeting that I just recorded with another participant to show you.

(Participant views pre-recorded personal greeting of confederate)

(Confederate's script: Hello, my name is _____. I was born and raised in Saskatoon. I'm in my first year of Arts and Science. In my spare time, I like to _____ (watch movies, especially action movies/do something active, like go swimming or running).

R: Participant's name, so now I'd like to ask you to record a short personal greeting for _____ (name of confederate) as well.

(Participant records greeting on computer webcam and then plays a set of 10 computer trials. After this, participant will be shown another personal video greeting of a different opponent (confederate 2) and asked to play another set of 10 computer trials. The script for the second confederate will be identical to the first except for name and interest. The participant will be told that their previously recorded personal greeting will be shown to their new opponent (confederate 2))

APPENDIX Q: RESEARCHER'S SCRIPT (CONDITION 2 PRECEDES CONDITION 1) MAIN STUDY

After providing participants with the instructions to the game and prior to beginning the $10 Trust Game

R(eseacher): Ok, participant's name, to give you a sense of who you'll be playing. I've got a video greeting that I just recorded with another participant to show you.

(Participant views pre-recorded personal greeting of confederate)

(Confederate's script: Hello, my name is _____. I was born and raised in Saskatoon. I'm in my first year of Arts and Science. In my spare time, I like to _____ (watch movies, especially sci-fi/do something active, like go swimming or running).

R: Participant's name, so now I'd like to ask you to record a short personal greeting for _____ (name of confederate) as well.

(Participant records greeting on computer webcam and then plays a set of 10 computer trials. After this, participant will be shown another personal video greeting of a different opponent (confederate 2) and asked to play another set of 10 computer trials. The script for the second confederate will be identical to the first except for name and interest. The participant will be told that their previously recorded personal greeting will be shown to their new opponent (confederate 2))

APPENDIX R: MIXED ANOVAS FOR REMAINING PSYCHOPATHY SUBSCALES BY CONDITION ON LYING FREQUENCY

ANOVA for Condition and Secondary Psychopathy (SP) Subscale on Lying Frequency

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.489	.004	.486
SP Subscale	1	.570	.005	.452
Condition * SP Subscale	1	2.108	.017	.149
Error	124	(4.391)[a]	(16.550)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Rebellious Nonconformity (RN) Subscale on Lying Frequency

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.115	.001	.736
RN Subscale	1	.008	.000	.927
Condition * RN Subscale	1	.335	.003	.564
Error	125	(4.567)[a]	(16.499)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Blame Externalization (BE) Subscale on Lying Frequency

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.163	.001	.687
BE Subscale	1	.936	.007	.335
Condition * BE Subscale	1	.536	.004	.466
Error	125	(4.560)[a]	(16.377)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Carefree Nonplanfulness (CN) Subscale on Lying Frequency

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.162	.001	.688
CN Subscale	1	1.683	.013	.197
Condition * CN Subscale	1	.258	.002	.612
Error	125	(4.570)[a]	(16.281)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Social Influence (SOI) Subscale on Lying Frequency

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.146	.001	.703
SOI Subscale	1	.000	.000	.986
Condition * SOI Subscale	1	.301	.002	.584
Error	125	(4.568)[a]	(16.500)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Fearlessness (F) Subscale on Lying Frequency

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.167	.001	.684
F Subscale	1	3.156	.025	.078
Condition * F Subscale	1	.322	.003	.571
Error	125	(4.568)[a]	(16.094)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Stress Immunity (STI) Subscale on Lying Frequency

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.154	.001	.696
STI Subscale	1	1.283	.010	.259
Condition * STI Subscale	1	.527	.004	.469
Error	125	(4.560)[a]	(16.332)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Coldheartedness (C) Subscale on Lying Frequency

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.301	.002	.584
C Subscale	1	.144	.001	.705
Condition * C Subscale	1	2.736	.021	.101
Error	125	(4.481)[a]	(16.481)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

APPENDIX S: MIXED ANOVAS FOR REMAINING PSYCHOPATHY SUBSCALES BY CONDITION ON LYING SEVERITY

ANOVA for Condition and Secondary Psychopathy (SP) Subscale on Lying Severity

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.095	.001	.759
SP Subscale	1	1.824	.014	.179
Condition * SP Subscale	1	3.366	.026	.069
Error	124	(119.089)[a]	(324.000)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Rebellious Nonconformity (RN) Subscale on Lying Severity

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.009	.000	.924
RN Subscale	1	.401	.003	.528
Condition * RN Subscale	1	1.016	.008	.315
Error	125	(124.183)[a]	(343.156)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Blame Externalization (BE) Subscale on Lying Severity

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.001	.000	.979
BE Subscale	1	.182	.001	.670
Condition * BE Subscale	1	.419	.003	.519
Error	125	(124.774)[a]	(343.755)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Carefree Nonplanfulness (CN) Subscale on Lying Severity

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.000	.000	.988
CN Subscale	1	.219	.002	.641
Condition * CN Subscale	1	.300	.002	.585
Error	125	(124.893)[a]	(343.655)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Social Influence (SOI) Subscale on Lying Severity

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.007	.000	.934
SOI Subscale	1	.106	.001	.745
Condition * SOI Subscale	1	.039	.000	.844
Error	125	(125.153)[a]	(343.963)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Fearlessness (F) Subscale on Lying Severity

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.005	.000	.945
F Subscale	1	2.400	.019	.124
Condition * F Subscale	1	1.905	.015	.170
Error	125	(123.13)[a]	(337.771)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Stress Immunity (STI) Subscale on Lying Severity

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.000	.000	.998
STI Subscale	1	.000	.000	.984
Condition * STI Subscale	1	1.861	.015	.175
Error	125	(123.356)[a]	(344.255)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

ANOVA for Condition and Coldheartedness (C) Subscale on Lying Severity

Source	*df*	*F*	Partial η^2	*p*
Condition	1	.012	.000	.912
C Subscale	1	.525	.004	.470
Condition * C Subscale	1	2.384	.019	.125
Error	125	(122.850)[a]	(342.816)[b]	

Note. Values enclosed in parentheses represent mean square errors.
[a] = Error term for the test of within-subjects effects and [b] = Error term for the test of between-subjects effects.

APPENDIX T: COMPARISONS OF DIFFERENCES IN THE CORRELATIONS BETWEEN MEASURE TOTALS AND DEPENDENT VARIABLES IN MALES AND FEMALES

	Mach-IV Total	LSRP Total	PPI-R Total
	Fisher's *Z* (p value)	Fisher's *Z* (p value)	Fisher's *Z* (p value)
Non-Exposure Lying Frequency	-0.85 (.395)	-0.95 (.343)	-0.14 (.889)
Exposure Lying Frequency	-0.83 (.407)	-1.38 (.168)	-0.43 (.667)
Non-Exposure Lying Severity	-1.44 (.150)	-1.29 (.197)	0.20 (.407)
Exposure Lying Severity	0.24 (.810)	-0.42 (.675)	0.19 (.849)

APPENDIX U: COMPARISONS OF DIFFERENCES IN THE CORRELATIONS BETWEEN MEASURE SUBSCALE TOTALS AND DEPENDENT VARIABLES IN MALES AND FEMALES

	PP	SP	ME	RN	BE	CN	SOI	F	STI	C
	Fisher's *Z* (p value)	Fisher's *Z* (p value)	Fisher's *Z* (p value)	Fisher's *Z* (p value)	Fisher's *Z* (p value)	Fisher's *Z* (p value)	Fisher's *Z* (p value)	Fisher's *Z* (p value)	Fisher's *Z* (p value)	Fisher's *Z* (p value)
Non-Exposure Lying Frequency	-0.60 (.548)	-0.98 (.327)	-0.24 (.810)	-0.20 (.842)	0.07 (.131)	-0.87 (.384)	0.71 (.477)	-0.17 (.865)	-0.39 (.697)	-0.71 (.478)
Exposure Lying Frequency	-0.07 (.516)	-1.67 (.095)	-1.32 (.187)	0.26 (.509)	1.12 (.263)	-0.90 (.368)	1.81 (.070)	-0.23 (.818)	-0.78 (.435)	-0.82 (.412)
Non-Exposure Lying Severity	-0.92 (.358)	-1.23 (.219)	-0.62 (.535)	-1.17 (.242)	0.83 (.407)	-1.56 (.119)	0.80 (.423)	-0.54 (.589)	-0.14 (.889)	-1.13 (.259)
Exposure Lying Severity	0.36 (.719)	-1.26 (.208)	-0.43 (.667)	-0.11 (.912)	1.61 (.107)	-0.37 (.711)	1.88 (.060)	-0.05 (.960)	-0.91 (.363)	-0.54 (.589)

Note. PP = Primary Psychopathy; SP = Secondary Psychopathy; ME = Machiavellian Egocentricity; RN = Rebellious Nonconformity; BE = Blame Externalization; CN = Carefree Nonplanfulness; SOI = Social Influence; F = Fearlessness; STI = Stress Immunity; C = Coldheartedness.

APPENDIX V: QUESTION 3 (“NEVER”) BY QUESTION 1 CROSS TABULATION & QUESTION 3 (“OFTEN” OR “VERY OFTEN”) BY QUESTION 1 CROSS TABULATION

	“How Often Do you Lie in a Week?”
	Never (n = 9)
Very Much Below Average	1
Below Average	3
Average	3
Above Average	2
Very Much Above Average	0

	“How Often Do you Lie in a Week?”	
	Often (n = 9)	Very Often (n = 1)
Very Much Below Average	0	0
Below Average	0	0
Average	3	0
Above Average	5	0
Very Much Above Average	1	1

APPENDIX W: MEANS OF ALL MEASURE TOTALS AND DEPENDENT VARIABLES FOR PARTICIPANTS WHO ANSWERED "NEVER" TO QUESTION 3

	"How Often Do You Lie in a Week?"	
	Never (*SD*) (*n* = 9)	Overall (*SD*)[a] (*n* = 150)
Mach-IV Total	51.11 (7.11)	52.67 (10.09)
LSRP IV Total	38.89 (5.42)	47.35 (9.32)
PPI-R total	297.67 (27.66)	315.40 (33.81)
Non-Exposure Lying Frequency	2.71 (2.63)[b]	3.61 (3.27)[c]
Exposure Lying Frequency	2.00 (3.11)[b]	3.70 (3.19)[c]
Non-Exposure Lying Severity	9.92 (10.46)[b]	15.63 (15.20)[c]
Exposure Lying Severity	7.14 (12.28)[b]	15.53 (15.32)[c]

[a] = Overall means and standard deviations reproduced from Tables 3.3 and 3.7 for comparison purposes.
[b]*n* = 7. [c]*n* = 127.

APPENDIX X: MEANS OF ALL MEASURE TOTALS AND DEPENDENT VARIABLES FOR PARTICIPANTS WHO ANSWERED "OFTEN" OR "VERY OFTEN" TO QUESTION 3

	"How Often Do You Lie in a Week?"	
	Often or Very Often (*SD*) (*n* = 10)	Overall (*SD*)[a] (*n* = 150)
Mach-IV Total	58.80 (12.70)	52.67 (10.09)
LSRP IV Total	54.30 (12.49)	47.35 (9.32)
PPI-R total	332.10 (31.94)	315.40 (33.81)
Non-Exposure Lying Frequency	4.00 (3.13)	3.61 (3.27)[b]
Exposure Lying Frequency	4.20 (3.94)	3.70 (3.19)[b]
Non-Exposure Lying Severity	16.70 (14.21)	15.63 (15.20)[b]
Exposure Lying Severity	17.00 (17.78)	15.53 (15.32)[b]

[a] = Overall means and standard deviations reproduced from Tables 3.3 and 3.7 for comparison purposes.
[b] $n = 127$.